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PREFATORY NOTE

The *Research Bulletin* of the American Foundation for the Blind is intended to be a means of publication for some scientific papers which, for a variety of reasons, may not reach the members of the research community to whom they may prove most useful or helpful. Among these papers one may include theses and dissertations of students, reports from research projects which the Foundation has initiated or contracted for, and reports from other sources which, we feel, merit wider dissemination. Only a few of these find their way even into journals which do not circulate widely; others may never be published because of their length or because of lack of interest in their subject matter.

The *Research Bulletin* thus contains both papers written especially for us and papers previously published elsewhere. The principal focus may be psychological, sociological, technological, or demographic. The primary criterion for selection is that the subject matter should be of interest to researchers seeking information relevant to some aspect or problem of visual impairment; papers must also meet generally accepted standards of research competence.

Since these are the only standards for selection, the papers published here do not necessarily reflect the opinion of the Trustees and staff of the American Foundation for the Blind.

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Since our aim is to maximize the usefulness of this publication to the research community, we solicit materials from every scientific field, and we will welcome reactions to published articles.

M. Robert Barnett
Executive Director
American Foundation
for the Blind


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METHODOLOGY IN TWO CALIFORNIA HEALTH SURVEYS*

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PART I: HOUSEHOLD SURVEY METHODS

Summarizing the discussion of Woolsey and Nisselson (1), morbidity consists of stages that may be conceptualized as forming a continuum. This continuum ranges from a hypothetical freedom from any pathological change to a state that may result in death. There are two approaches to placing a given type of morbidity along this continuum. One approach involves a direct measure of pathological change, often in terms of tissue damage or alteration in body chemistry. This approach is found in the clinical determination of disease. The second approach relates to a person's awareness of morbidity. This awareness often determines a person's actions as a result of disease.

In some types of epidemiologic studies it is necessary to measure morbidity differences between population groups by considering all cases detectable by clinical tests regardless of whether there have been subjective symptoms or awareness of morbidity. Clearly, such objectives require measurements over the scale of pathological change.

To provide measures of disease suitable for estimating the market for a prescription drug, it may be sufficient to know about cases that have reached the stage where medical care has been sought. These objectives require measurements on the scale of awareness of morbidity and, depending on the accuracy to which diagnostic information must be known, they may require measurements on the scale of pathological change as well.

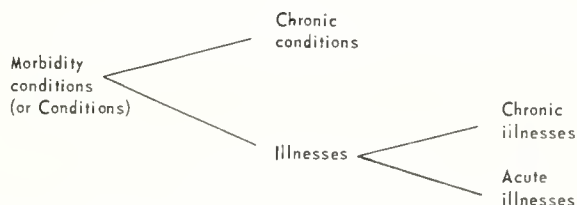
These examples illustrate that either the scale of pathological change or the scale of morbidity awareness, and sometimes both scales, must be considered, depending on the uses to be made of the morbidity data. There is no single, all-purpose cutoff point.

* This article is an excerpt from Public Health Monograph No. 70, Public Health Service, U.S. Department of Health, Education, and Welfare. The reader should note that comments within brackets [] are editor's remarks.

In the discussions of household survey methods which follow, we shall be primarily concerned with the individual's awareness of morbidity. [The need for determining the relationships between pathological change and awareness of morbidity is discussed in Part II of the original document.]

For the purpose of household survey measurement, morbidity is considered basically as a departure from a state of physical or mental well-being of which the affected individual is aware. It includes not only active or progressive disease but also static chronic defects, resulting from disease, injury, or congenital malformation. The report by an individual of morbidity caused by a particular disease, injury, or impairment is called a morbidity condition, or simply a condition.

Conditions, in terms of the approach used in the San Jose and California Health Surveys, consist of two general categories: chronic conditions and illnesses. Chronic conditions consist of relatively long-term conditions (including defects or impairments) which may or may not cause illness. During the course of such a condition there may be one or more periods when the individual considers himself to be "sick" or "injured." These periods are spoken of as illnesses. Such periods, when caused by a chronic condition, are called chronic illnesses. Periods of nonchronic illness are referred to as acute illnesses. This classification may be depicted as follows:



Each type of condition described above may be classified as to relative severity in terms of the behavioral consequences of the condition. This means that actions taken by the individual as a result of the condition must be determined. For illnesses, such actions may involve the restricting of activities, including going to bed or entering a hospital, and the seeking of medical attention. Additional information may be sought about the effects of chronic conditions in terms of hospitalization, frequency of physician visits, frequency of taking medicines or treatment, and long-term limitation of activities. [Appendix B of the original document contains definitions of the morbidity terms used in this report.]

It is clear that an individual's reporting of morbidity in a household survey is contingent on a succession of events. These include: (a) awareness that a given condition is a departure from physical or mental well-being; (b) understanding the operational definitions of morbidity used in the survey; (c) remembering that the morbidity condition occurred or still exists; and (d) reporting the condition to an interviewer. The chain may be broken at any step. The following sections of Part I discuss inferences that can be drawn from the survey data concerning this chain of events.

1. Question Yield at Interview

The questionnaire serves as the main means for communicating the operational definitions of morbidity to the respondent. The approaches used for questioning about illness and chronic conditions and the yield of such questioning are described separately for the San Jose Survey and the California Health Survey.

San Jose Survey

In the San Jose Survey the initial interview questions about illness and chronic conditions were the same for each of the six experimental groups. In the three repeat interviews of group II [see Figure 2 of the original document] supplemental illness questions were asked after "standard" questions common to both initial and repeat interviews had been answered. We shall discuss the relative number of illnesses and chronic conditions elicited by each of the standard questions asked on all initial interviews and the increased reporting of illness and chronic conditions resulting from the supplemental questions.

The Standard Questions

For each person covered by the initial interview, the standard group of illness-recall questions shown in Figure 1 was asked. These started with very general questions as to whether household members had been sick or had any accidents or injuries during the recall periods covered by the interview (Q. 38 through 40), and included general questions about chronic conditions or impairments (Q. 43 and 44). These general questions were intended to indicate the broad frame of reference of the inquiry. Since this type of questioning might lead to underreporting of conditions not currently causing illness, it was supplemented by an inquiry, for persons reporting no illnesses, about illnesses occurring since the end of the year (Q. 41), by an inquiry covering hospitalization (Q. 42), and by a fairly extensive checklist of chronic conditions (Q. 45).

The ordering of questions was from the general to the specific. It was thought that asking more general questions first

38. Now I have some questions about illness yesterday. We're interested in all kinds, whether serious or not, even if they're not causing trouble right now -	(a) Was he sick in bed yesterday?	<input type="checkbox"/> Yes <input type="checkbox"/> No																								
	(b) Even though he wasn't sick in bed, was he sick at all yesterday - either all day or part of the day?	<input type="checkbox"/> Yes <input type="checkbox"/> No																								
	(c) Did he feel as well as usual yesterday?	<input type="checkbox"/> Yes <input type="checkbox"/> No																								
39. We also want to count accidents and injuries -	(a) Did he have an accident or injury yesterday?	<input type="checkbox"/> Yes <input type="checkbox"/> No																								
	(b) Did he feel any effects yesterday from an earlier accident or injury?	<input type="checkbox"/> Yes <input type="checkbox"/> No																								
40. Now I want to talk about illness, accidents and injuries during the month of (____ last month)	(a) Was he sick or not feeling well at any time during (besides the ... you already told me about)?	<input type="checkbox"/> Yes <input type="checkbox"/> No																								
	(b) During ____ did he have any accidents or injuries (besides the ... you already told me about)?	<input type="checkbox"/> Yes <input type="checkbox"/> No																								
	(c) Did he feel any effects during ____ from an earlier accident or injury (besides the ... you already told me about)?	<input type="checkbox"/> Yes <input type="checkbox"/> No																								
41. Ask for each person with no illness or injury reported in items 38-40 - Did he have any illness or injury at any time since December 1, 1951?		<input type="checkbox"/> Yes <input type="checkbox"/> No																								
42. Now I'm going to ask you to think back over the past 12 months ____ from ____ through ____	(a) Was he in a hospital as a patient overnight or longer during any part of the past 12 months?	<input type="checkbox"/> Yes <input type="checkbox"/> No																								
	(b) Ask if "No" in (a) Was he in a hospital as a patient overnight or longer at any time since January 1, 1951?	<input type="checkbox"/> Yes <input type="checkbox"/> No																								
43. Does he have any chronic condition or ailment, or is there anything else wrong with him, even though it doesn't bother him all the time?		<input type="checkbox"/> Yes <input type="checkbox"/> No																								
44. Does he have any impairment or handicapping condition of any kind? (Even if it doesn't interfere with his work or other usual activities?)		<input type="checkbox"/> Yes <input type="checkbox"/> No																								
45. I have a card with the names of some chronic conditions and impairments. Please look over the card, and tell me whether any member of this household has any of these conditions. (Read list to respondent and enter any conditions reported.)		<input type="checkbox"/> Yes <input type="checkbox"/> No																								
<table border="0"> <tr> <td>Asthma</td> <td>Deafness (Complete or partial)</td> <td>Heart disease</td> <td>Rheumatism or arthritis</td> <td>Varicose veins</td> </tr> <tr> <td>Blindness (Complete or partial)</td> <td>Diabetes</td> <td>Hemorrhoids</td> <td>Stomach ulcers</td> <td>or</td> </tr> <tr> <td>Chronic sinus condition</td> <td>Hardening of the arteries</td> <td>Hernia</td> <td>Tuberculosis</td> <td>(Any other impairment or chronic disease or condition)</td> </tr> <tr> <td>Chronic skin disorder</td> <td>Hay fever</td> <td>Loss of a limb</td> <td>Tumors</td> <td></td> </tr> <tr> <td></td> <td></td> <td>Paralysis</td> <td></td> <td></td> </tr> </table>		Asthma	Deafness (Complete or partial)	Heart disease	Rheumatism or arthritis	Varicose veins	Blindness (Complete or partial)	Diabetes	Hemorrhoids	Stomach ulcers	or	Chronic sinus condition	Hardening of the arteries	Hernia	Tuberculosis	(Any other impairment or chronic disease or condition)	Chronic skin disorder	Hay fever	Loss of a limb	Tumors				Paralysis		
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		Paralysis																								

Figure 1. Standard Questions: San Jose Survey Group I through VI, initial interviews.

might not restrict the respondent's frame of reference as sharply as starting with specific questions. Questions having a common time reference were grouped together, and the number of different time references was kept as small as possible, consistent with other survey objectives. The questions about illness and injuries were restricted to 1-day recall (Q. 38 and 39) and calendar-month recall (Q. 40). The questions concerning chronic conditions (Q. 43 through 45) referred to the present. The inquiries about hospitalization (Q. 42) referred to the "past 12 months."

In interviewing a reporter who was acting as proxy respondent for other related members of the household, the individual questions were grouped as follows:

Question 38: Reporter first, followed by each other family member separately.

Question 39: Reporter first, followed by each other family member separately.

Question 40: Reporter first, followed by each other family member separately.

Question 41: Reporter first, followed by each other family member separately.*

Question 42: Reporter first, followed by each other family member separately.

Question 43 and 44: Reporter first, followed by each other family member separately.

Question 45: All family members at one time.

As soon as a condition was reported in response to one of the questions, further information was obtained about the condition by means of three tables included on the questionnaire. One table was for illnesses (including injuries), a second for hospitalization, and a third for chronic conditions. One line of the appropriate table was filled for each condition reported, using a sequence of questions appearing in successive columns of the table. [The format of these tables appears in Appendix E of the original document.]

Considerable emphasis was placed on having each interviewer follow the prescribed sequence of questioning, asking each question exactly as worded on the questionnaire. The interviewer's

* Question 41 was asked only for persons for whom no illness or injury was reported in questions 38 through 40.

training suggested additional questions to elicit further information when the respondent's answer to the original question was incomplete.

Illness Reporting

The monthly illness prevalence yield from the standard questions used on all initial interviews is shown in Table 1. Illnesses re-

TABLE 1

PERCENTAGE DISTRIBUTION OF INITIAL INTERVIEW REPORTS OF MONTHLY PREVALENCE OF ILLNESS BY STANDARD QUESTION TYPE ELICITING RESPONSE, ACCORDING TO ILLNESS TYPE AND SEVERITY: SAN JOSE, JANUARY-MAY¹ 1952

Standard question type	Total illness			Acute illness			Chronic illness		
	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.
All standard questions (Q. 38-45).....	100	100	100	100	100	100	100	100	100
1-day recall (Q. 38-39).....	16	17	15	12	11	13	26	30	18
Calendar-month recall (Q. 40).....	76	77	74	84	85	82	57	59	54
Regarding illness (Q. 40a).....	67	72	60	74	79	65	53	56	49
Regarding injury (Q. 40b).....	6	4	10	9	5	15	1	1	0
Regarding effects of earlier injury (Q. 40c).....	2	2	3	2	1	2	4	3	5
Recall-to-December 1, 1951 (Q. 41 ²).....	3	3	3	3	3	3	3	3	3
Calendar-year hospitalization (Q. 42).....	0	0	—	0	0	—	0	0	—
Chronic condition (Q. 43-45).....	5	2	8	1	0	1	14	7	25
Not ascertained.....	0	—	0	0	—	0	0	—	0

¹ Groups I through VI, initial interviews.

² Asked only for persons with no illness or injury reported in questions 38 through 40.

ported as existing during a calendar-month recall period are distributed according to the type of question which elicited the report. The questions about illnesses "last month" accounted for more than three-quarters of the illnesses reported. Fourteen percent of the chronic illnesses were not reported until the questions about chronic conditions had been asked, and the reporter then remembered that the reported chronic condition had caused illness during the previous calendar month.

In the three repeat interviews of group II, supplemental questions were asked following the standard questions. In contrast to the standard questions which inquired directly about the

occurrence of illness, the supplemental questions explored alternative approaches to gaining illness information through (a) a symptom approach (Figures 2 and 3) and (b) a medical care approach (Figure 4). In the symptom approach (Q. 61) a checklist of selected symptoms of illness and chronic conditions was read.

61. (a) This month we are also interested in symptoms. I have here a card with the names of some symptoms. Please look over the card, and tell me whether any member of this household had any of these symptoms yesterday.	<input type="checkbox"/> Yes <input type="checkbox"/> No Symptom(s):
(b) What caused the ... (symptom)?	Cause:
(c) Now, please tell me whether any member of this household had any of these symptoms last month.	<input type="checkbox"/> Yes <input type="checkbox"/> No Symptom(s):
(d) What caused the ... (symptom)?	Cause:

Figure 2. Symptom Questions: San Jose Survey Group II, second and third repeat interviews.

Abnormal bleeding from any part of the body Convulsions or fits Coughing Dizziness Earache Fever Headache Indigestion Nervousness Night sweats Pain in chest	Pain or swelling in joints Paralysis, or loss of use, of any limb or other part of the body Shortness of breath Skin rash or sores Swelling of ankles Swelling or lump in any other part of the body Trouble with bowels or urination (constipation, diarrhea, excessive urination, etc.) Upset stomach or Any other special symptom
--	---

Figure 3. Symptom Checklist: San Jose Survey Group II, second and third repeat interviews.

57. Now I have a few questions about medicines and medical treatment last month.	(a) During . . . did he take any medicine or injections prescribed by a physician (besides for the ... you've already told me about)? If "Yes" - For what illness or condition did he take it?	<input type="checkbox"/> Yes <input type="checkbox"/> No Condition(s):
	(b) During . . . did he take any other medication or home remedies (besides for the ... you've already told me about)? If "Yes" - For what illness or condition did he take it?	<input type="checkbox"/> Yes <input type="checkbox"/> No Condition(s):
	(c) During . . . did he take any other treatment such as heat treatments, special massages, dental treatment, or the like (besides for the ... you've already told me about)? If "Yes" - For what illness or condition did he take it?	<input type="checkbox"/> Yes <input type="checkbox"/> No Condition(s):
58. And now, I'd like to ask the same questions about yesterday.	(a) Yesterday, did he take any medicine or injections prescribed by a physician (besides for the ... you've already told me about)? If "Yes" - For what illness or condition did he take it?	<input type="checkbox"/> Yes <input type="checkbox"/> No Condition(s):
	(b) Yesterday, did he take any other medication or home remedies (besides for the ... you've already told me about)? If "Yes" - For what illness or condition did he take it?	<input type="checkbox"/> Yes <input type="checkbox"/> No Condition(s):
	(c) Yesterday, did he take any other treatment such as heat treatments, special massages, dental treatment, or the like (besides for the ... you've already told me about)? If "Yes" - For what illness or condition did he take it?	<input type="checkbox"/> Yes <input type="checkbox"/> No Condition(s):
59. Ask for each person with no illness or chronic condition reported for last month.	(a) During . . . was he treated by a doctor at anytime?	<input type="checkbox"/> Yes <input type="checkbox"/> No
	(b) During . . . was he attended by a visiting nurse?	<input type="checkbox"/> Yes <input type="checkbox"/> No
	(c) During . . . did he make any visits to a hospital clinic or out-patient department?	<input type="checkbox"/> Yes <input type="checkbox"/> No
	(d) During . . . was he treated by a dentist?	<input type="checkbox"/> Yes <input type="checkbox"/> No
	(e) During . . . did he have any other medical treatment?	<input type="checkbox"/> Yes <input type="checkbox"/> No
60. For what illness or condition was he treated?		Condition(s):

Figure 4. Medical Care Questions: San Jose Survey Group II, first and second repeat interviews.

In the medical care approach, questions were asked about activities sometimes associated with illness, the taking of medicines and treatments (Q. 57 and 58). For each person for whom no illness or chronic conditions had previously been reported, the questionnaire also contained questions about visits to medical or dental practitioners during the recall month (Q. 59 and 60).

The medical care questions and symptom list were used singly and in combination. The medical care questions were asked on the first repeat interview, both the symptom list and the medical care questions on the second repeat interview, and only the symptom list on the third repeat interview.

In Table 2 the increase in the monthly prevalence of illness resulting from the supplemental questions is shown as a percentage of the monthly prevalence of illness elicited by the standard questions. On the first repeat interview the medical care questions increased the illness prevalence yield by 15 percent.

TABLE 2

INCREASE IN MONTHLY PREVALENCE OF ILLNESS RESULTING FROM SUPPLEMENTAL QUESTIONS, EXPRESSED AS A PERCENTAGE OF MONTHLY PREVALENCE OF ILLNESS ELICITED BY STANDARD QUESTIONS, FOR EACH MONTH OF REPEAT INTERVIEWING, BY SUPPLEMENTAL QUESTION TYPE AND ILLNESS TYPE AND SEVERITY: SAN JOSE, MARCH-MAY¹ 1952

(Excludes persons gained by the panel after the beginning of the survey or lost from the panel before its conclusion.)

Illness type and severity	Percent of standard-question illnesses			
	First repeat interview: Medical care questions (Q. 57-59)	Second repeat interview		Third repeat interview
		Symptom list (Q. 61)	Medical care questions (Q. 57-59)	Symptom list (Q. 61)
Total illness.....	15	50	19	29
With activity restriction and/or medical attendance.....	13	20	16	12
Without activity restriction or medical attendance.....	21	96	22	60
Acute illness.....	14	36	19	25
With activity restriction and/or medical attendance.....	13	14	14	9
Without activity restriction or medical attendance.....	16	68	27	58
Chronic illness.....	20	92	16	36
With activity restriction and/or medical attendance.....	15	37	22	18
Without activity restriction or medical attendance.....	32	194	6	65

Column II, first, second, and third repeat interviews

¹ Group II, first, second, and third repeat interviews.

On the second repeat interview the symptom list yielded an increase of 50 percent over the number of illnesses elicited by the standard questions with chronic illness showing the greatest relative increase. The medical care questions, even though they were asked after the symptom list, increased the relative yield about as much as on the first repeat interview. On the third repeat interview, the yield from the symptom list was lower (29 percent) than on the second repeat interview. For illnesses without activity restriction or medical attention, the symptom list produced a much larger percentage of gain than did the medical care questions. For the more severe illnesses the relative increases elicited by the two approaches were about the same.

Table 3 shows the yield from each type of medical care question. Questions about the taking of medicines, home remedies, and other treatments (Q. 57 a through c) and about treatment by a doctor (Q. 59a) elicited most of the additional reports of illness. Questions concerning medical care from other sources were relatively unproductive.

TABLE 3

PERCENTAGE DISTRIBUTION OF REPORTS OF MONTHLY PREVALENCE OF ILLNESS ELICITED BY MEDICAL CARE QUESTIONS AT REPEAT INTERVIEWS, BY QUESTION TYPE, ACCORDING TO ILLNESS TYPE AND SEVERITY: SAN JOSE, MARCH-APRIL¹ 1952

(Excludes persons gained by the panel after the beginning of the survey or lost from the panel before its conclusion.)

Medical care question type	Total illness			Acute illness			Chronic illness		
	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.
All medical care questions (Q. 57-59).....	100	100	100	100	100	100	100	100	100
Calendar-month recall of care (Q. 57).....	78	68	91	76	56	96	85	92	71
Medication prescribed by doctor (Q. 57a).....	32	40	24	20	19	22	65	85	29
Other medication (Q. 57b).....	31	5	62	37	7	67	15	—	43
Other treatment (Q. 57c).....	15	22	6	19	30	7	5	8	—
1-day recall of care (Q. 58a-c).....	5	2	9	4	4	4	10	—	29
Further calendar-month recall questions asked only for persons reporting no illness (Q. 59).....	16	30	—	20	41	—	5	8	—
Treated by doctor (Q. 59a).....	12	22	—	15	30	—	5	8	—
Attended by visiting nurse (Q. 59b).....	—	—	—	—	—	—	—	—	—
Visited hospital clinic (Q. 59c).....	1	2	—	2	4	—	—	—	—
Treated by dentist (Q. 59d).....	1	2	—	2	4	—	—	—	—
Any other medical treatment (Q. 59e).....	1	2	—	2	4	—	—	—	—

¹ Group II, first and second repeat interviews.

Chronic Conditions

For the standard questions used in the initial interviews of all San Jose Survey experimental groups, the general questions about illness were followed by general questions about chronic conditions (Q. 43) and impairments (Q. 44), and these were followed by a list of specific chronic conditions and impairments (Q. 45). The relative proportions of chronic conditions yielded by this sequence of questions are shown in Table 4. Questions on recent

TABLE 4

PERCENTAGE DISTRIBUTION OF INITIAL INTERVIEW REPORTS OF CHRONIC CONDITIONS BY STANDARD QUESTION TYPE ELICITING RESPONSE, ACCORDING TO WHETHER MEDICALLY ATTENDED: SAN JOSE, FEBRUARY-JUNE¹ 1952

Standard question type	Chronic conditions		
	Total	Medi- cally at- tended	Never medi- cally at- tended
All standard questions (Q. 38-45).....	100	100	100
1-day and calendar-month recall of illness and injury (Q. 38-41).....	17	11	36
Calendar-year hospitalization (Q. 42).....	4	5	—
Chronic conditions and impairments (Q. 43-45).....	79	84	62
Chronic condition question (Q. 43).....	40	45	22
Impairment question (Q. 44).....	7	8	3
List of specific chronic conditions (Q. 45).....	32	31	37
Not ascertained.....	1	0	2

¹ Groups I through VI, initial interviews.

illness and hospitalization accounted for only 21 percent of the chronic conditions reported. When such questions were supplemented by the general questions on chronic conditions and impairments (Q. 43 and 44), the yield was greatly increased; an additional 47 percent of chronic conditions were reported. The final probing question (Q. 45), consisting of the list of 19 chronic conditions and impairments, accounted for a third of all the chronic conditions elicited in initial interviews. Thus, after chronic conditions causing recent illness had been recorded, questions depending on the reporter's understanding of the general terms "chronic conditions," "impairments," and "handicapping conditions" still failed to elicit reports of many chronic condi-

tions. These remaining chronic conditions were reported in response to the checklist of specific chronic conditions.

In Table 5 selected chronic conditions are listed, the categories corresponding closely to the chronic conditions named on the checklist (Q. 45). For each chronic condition the relative

TABLE 5

PERCENTAGE DISTRIBUTION OF INITIAL INTERVIEW REPORTS OF CHRONIC CONDITIONS BY STANDARD QUESTION TYPE ELICITING RESPONSE, ACCORDING TO DIAGNOSTIC CATEGORY: SAN JOSE, FEBRUARY-JUNE¹ 1952

Diagnostic category	Total chronic conditions elicited (Q. 38-45)	Illness, injury, and hospitalization questions (Q. 38-42)	Chronic condition and impairment questions (Q. 43-44)	List of specific chronic conditions (Q. 45)
All categories.....	100	21	47	32
Diabetes.....	100	22	67	11
Asthma.....	100	14	66	20
Ulcer of stomach and duodenum.....	100	31	44	25
Heart disease (excluding hypertensive heart disease).....	100	26	47	27
Arteriosclerotic and degenerative heart disease.....	100	26	39	35
Arthritis and rheumatism.....	100	19	43	38
Hypertensive disease (including hypertensive heart disease).....	100	23	37	40
Hernia.....	100	22	29	49
Hay fever.....	100	11	40	49
Deafness and other chronic diseases of the ear.....	100	5	42	53
Hemorrhoids.....	100	9	18	73
Varicose veins.....	100	4	14	82
Other diagnostic categories.....	100	31	53	16

¹ Groups I through VI, initial interviews.

yield from the sequence of three different types of questions is shown: questions about recent illness, injury, and hospitalization; general questions about chronic conditions and impairments; and the chronic condition checklist. The contribution by the checklist question to the volume of chronic conditions reported varies widely. Most cases of asthma, diabetes, and stomach ulcers were reported before the checklist question was asked, whereas most cases of varicose veins and hemorrhoids were reported in response to that question.

Section 5 describes how repeat interviews, using illness questions identical with those used on initial interviews, resulted in reports of additional chronic conditions [see "Chronic Condition Reporting on Repeat Interviews" and Table 40 in Section

5 of Part I of the original document]. Primarily to aid in the reporting of recent illness, the repeat interviews also contained supplemental questions covering medical care and symptoms. Like the standard questions on repeat interviews, the supplemental questions elicited reports of additional chronic conditions. The percentage of additional chronic conditions yielded by the supplemental questions in each of the repeat interview months is shown in Table 6, the percentage base being the number of chronic conditions yielded by the standard questions in each repeat interview month.

TABLE 6

INCREASE IN CHRONIC CONDITIONS RESULTING FROM SUPPLEMENTAL QUESTIONS, EXPRESSED AS A PERCENTAGE OF CHRONIC CONDITIONS ELICITED BY STANDARD QUESTIONS, IN EACH MONTH OF REPEAT INTERVIEWING, BY SUPPLEMENTAL QUESTION TYPE: SAN JOSE, APRIL-JUNE¹ 1952

(Excludes persons gained by the panel after the beginning of the survey or lost from the panel before its conclusion.)

Supplemental question type	Percent of each month's standard-question chronic conditions
First repeat interview:	
Medical care questions (Q. 57-59).....	12
Second repeat interview:	
Symptom list (Q. 61).....	123
Medical care questions (Q. 57-59).....	35
Third repeat interview:	
Symptom list (Q. 61).....	25

¹ Group II, first, second, and third repeat interviews.

California Health Survey

Since the California Health Survey, like the San Jose Survey, was intended to provide as complete a picture of the extent of illness and chronic conditions as possible, definitions of these conditions were made as broad as possible. In discussing the questions used to elicit reports of illness and chronic conditions in the California Health Survey, we shall point out the contribution of experience gained from the San Jose and other morbidity surveys.

The Questions

The portions of the questionnaire used to elicit reports of ill-

ness and chronic conditions are reproduced in Figures 5 through 8. General questions were asked about sickness, accidents, and injuries during the 4 weeks preceding the week of interview (Q. 8 through 11) and about chronic conditions or impairments (Q. 14 and 15). These general questions were supplemented by inquiries covering the taking of medicines or treatments for illness (Q. 12 and 13) and by a checklist of chronic conditions (Q. 16) and a checklist of symptoms of chronic conditions (Q. 17). There was also an inquiry about hospitalization during the past 12 months (Q. 18).

PAST 4 WEEKS - ILLNESS We're interested in all kinds of illness, whether serious or not --	8. Were you sick at any time in the 4 weeks from Monday -- through last Sunday? (a) What was the matter? (b) Anything else?	<input type="checkbox"/> Yes <input type="checkbox"/> No
	9. During these 4 weeks did you have any accidents or injuries - big or little - that happened around the house? (a) What happened? (b) Anything else?	<input type="checkbox"/> Yes <input type="checkbox"/> No
	10. What about accidents or injuries away from home? (a) What happened? (b) Anything else?	<input type="checkbox"/> Yes <input type="checkbox"/> No
	11. Did you feel the effects of an earlier accident or injury? (a) What was the matter? (b) Anything else?	<input type="checkbox"/> Yes <input type="checkbox"/> No
	12. During these 4 weeks did you take any medicine or treatment prescribed by a doctor (besides for what you have already told me about)? (a) What was the matter? (b) Anything else?	<input type="checkbox"/> Yes <input type="checkbox"/> No
	13. Did you take any other medicine or home remedies during these 4 weeks for any (other) condition? (a) What was the matter? (b) Anything else?	<input type="checkbox"/> Yes <input type="checkbox"/> No
CHRONIC CONDITIONS, IMPAIRMENTS, AND HANDICAPPING CONDITIONS	14. Do you have any chronic conditions or ailments, even though they may not bother you all the time? (a) What are they? (b) Anything else?	<input type="checkbox"/> Yes <input type="checkbox"/> No
	15. Do you have any impairments or handicapping conditions, even though they may not interfere with your usual activities? (a) What are they? (b) Anything else?	<input type="checkbox"/> Yes <input type="checkbox"/> No

Figure 5. Illness and Chronic Condition Questions: California Health Survey

<p>CHRONIC CONDITION LIST</p> <p>I would like to ask about some specific conditions --</p>	<p>16. Has anyone in the family had any of these conditions during the past 12 months?</p> <table border="0"> <tr> <td>1. Hay fever</td> <td>19. Cerebral palsy</td> </tr> <tr> <td>2. Asthma</td> <td>20. Polio</td> </tr> <tr> <td>3. Chronic skin trouble</td> <td>21. Other paralysis</td> </tr> <tr> <td>4. Any allergy</td> <td>22. Epilepsy</td> </tr> <tr> <td>5. Chronic bronchitis</td> <td>23. Convulsions or spasms</td> </tr> <tr> <td>6. Hardening of arteries</td> <td>24. Migraine</td> </tr> <tr> <td>7. High blood pressure</td> <td>25. Tumor</td> </tr> <tr> <td>8. Heart trouble</td> <td>26. Diabetes</td> </tr> <tr> <td>9. Rheumatic fever</td> <td>27. Chronic sinus trouble</td> </tr> <tr> <td>10. Arthritis or rheumatism</td> <td>28. Tuberculosis</td> </tr> <tr> <td>11. Varicose veins</td> <td>29. Hernia or rupture</td> </tr> <tr> <td>12. Anemia</td> <td>30. Blindness</td> </tr> <tr> <td>13. Stomach ulcer</td> <td>31. Deafness</td> </tr> <tr> <td>14. Liver trouble</td> <td>32. Stammering or stuttering</td> </tr> <tr> <td>15. Gall bladder trouble</td> <td>33. Missing arm or leg</td> </tr> <tr> <td>16. Kidney trouble</td> <td>34. Handicap or defect present since birth</td> </tr> <tr> <td>17. Hemorrhoids or piles</td> <td>35. Any other chronic condition</td> </tr> <tr> <td>18. Neuritis</td> <td></td> </tr> </table>	1. Hay fever	19. Cerebral palsy	2. Asthma	20. Polio	3. Chronic skin trouble	21. Other paralysis	4. Any allergy	22. Epilepsy	5. Chronic bronchitis	23. Convulsions or spasms	6. Hardening of arteries	24. Migraine	7. High blood pressure	25. Tumor	8. Heart trouble	26. Diabetes	9. Rheumatic fever	27. Chronic sinus trouble	10. Arthritis or rheumatism	28. Tuberculosis	11. Varicose veins	29. Hernia or rupture	12. Anemia	30. Blindness	13. Stomach ulcer	31. Deafness	14. Liver trouble	32. Stammering or stuttering	15. Gall bladder trouble	33. Missing arm or leg	16. Kidney trouble	34. Handicap or defect present since birth	17. Hemorrhoids or piles	35. Any other chronic condition	18. Neuritis		<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>
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Figure 6. Chronic Condition List: California Health Survey

<p>SYMPTOM LIST</p> <p>I would like to ask you about some particular symptoms --</p>	<p>17. Has anyone in the family had any of these symptoms during the past 12 months?</p> <ol style="list-style-type: none"> 1. Abscessed or running ear 2. Many long-lasting or serious headaches 3. Skin rash, itching or breaking out 4. Lumps or discolored patches on the skin 5. Long-lasting pains in the chest 6. Long-lasting cough 7. Shortness of breath 8. Frequent backaches 9. Symptoms of overweight that cause trouble 10. Long-lasting pains or swelling in the joints 11. Swelling of ankles 12. Frequent diarrhea or constipation 13. Abnormal bleeding from any part of the body 	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>
--	--	---

Figure 7. Symptom List: California Health Survey

HOSPITALIZATION	18. During the past 12 months has anyone in the family been a patient in a hospital for overnight or longer?	<input type="checkbox"/> Yes <input type="checkbox"/> No
-----------------	--	--

Figure 8. Hospitalization Question: California Health Survey

Probing questions on the use of medicines, treatments, and home remedies (Q. 12 and 13) and checklists of chronic conditions and symptoms (Q. 16 and 17) were included in the California Health Survey interview because similar probes in the San Jose, Baltimore, and other health surveys had increased reports of illness and chronic conditions. The chronic condition list was expanded over that used in the San Jose Survey, and the symptom list was reduced to include symptoms of only the more severe chronic conditions.

The California Health Survey sample was randomized over 52 interview weeks, and the recall period for illness was based on the 4 weeks preceding the week of interview ("from Monday ... through last Sunday"). Compared with the San Jose Survey method of asking during an interview month about illnesses during the preceding calendar month, this procedure tended to reduce memory loss. It was thought that the use of beginnings and ends of calendar weeks to bracket the 4-week recall period would provide convenient reference points within which to recall the occurrence of illness.

Questions regarding illness and accidents "yesterday" (the day preceding the date of interview) were not used in the California Health Survey. An experiment performed in the Baltimore Health Survey had shown that such questions did not increase the amount of illness reported for a 4-week recall period.

For interviewing a person who was also responding for other related household members, the questions were grouped as follows:

Questions 8 through 13: Reporter first, followed by each other family member separately.

Questions 14 and 15: Reporter first, followed by each other family member separately.

Question 16: All family members at one time.

Question 17: All family members at one time.

Question 18: All family members at one time.

Questions 8 through 17 were asked in the prescribed order, and only a note made of conditions mentioned, before detailed questions were asked about each of the conditions reported. This procedure was a departure from the San Jose Survey, in which the interviewer stopped to fill a line in the appropriate table for each condition as it was reported. The San Jose Survey approach appeared to hinder complete reporting.

Illness Reporting

A percentage distribution of various types of illnesses prevalent during a 4-week recall period by the question type which elicited the illness report is shown in Table 7. Almost all of the acute illnesses were reported in response to the questions regarding illness in the past 4 weeks. More than one-fifth of the nonrestricting acute illnesses were reported in response to the medical care questions on medicines, treatments, and home remedies (Q. 12 and 13).

TABLE 7

PERCENTAGE DISTRIBUTION OF MONTHLY PREVALENCE OF ILLNESS BY QUESTION TYPE ELICITING RESPONSE, ACCORDING TO SEVERITY OF TOTAL ILLNESS AND PRESENCE OF ACTIVITY RESTRICTION FOR ACUTE AND CHRONIC ILLNESS: CALIFORNIA HEALTH SURVEY, APRIL 1954-MARCH 1955

Question type	Total illness			Acute illness			Chronic illness		
	Total	With activity restriction and/or med. att.	Without activity restriction or med. att.	Total	With activity restriction	Without activity restriction	Total	With activity restriction	Without activity restriction
All questions (Q. 8-18).....	100	100	100	100	100	100	100	100	100
4-week recall (Q. 8-13).....	63	79	52	95	98	94	48	70	43
Regarding sickness (Q. 8).....	34	56	20	62	86	44	22	54	15
Regarding injury (Q. 9-10).....	6	5	7	17	7	24	1	1	0
Regarding effects of earlier injury (Q. 11).....	4	3	5	2	1	2	6	5	6
Regarding medical care (Q. 12-13).....	18	15	20	15	3	22	19	10	22
Chronic conditions (Q. 14-17).....	36	20	47	3	1	5	52	29	57
Chronic condition question (Q. 14).....	11	7	14	0	0	0	16	11	17
Impairment question (Q. 15).....	4	2	5	0	0	—	5	2	6
List of specific chronic conditions (Q. 16).....	14	8	18	0	0	0	20	11	23
List of specific chronic symptoms (Q. 17).....	8	4	10	3	1	5	10	4	11
Calendar-year hospitalization (Q. 18).....	0	0	0	0	0	0	0	0	0
Not ascertained.....	1	1	1	1	0	1	1	1	1

More than half of the chronic illnesses were not reported in response to questions about illness in the past 4 weeks (Q. 8 through 13). These illnesses were reported when the reporter named a chronic condition, and then remembered, as a result of further questioning, that the condition had caused illness during

the 4-week recall period. A relatively greater proportion of nonrestricting chronic illnesses (57 percent) than of activity-restricting chronic illnesses (29 percent) was elicited in this fashion.

These data again demonstrate that direct questions about illness do not produce complete reporting. Questions about behavior associated with illness and about chronic conditions which may cause illness serve to increase the yield of illness reports.

Chronic Conditions

Table 8 contains a percentage distribution of chronic conditions of two severity levels by the type of question which first evoked the report of the chronic condition. As in the San Jose Survey almost a third of the chronic conditions were not reported until the reporter was presented with a checklist of specific chronic conditions (Q. 16). Even for chronic conditions of substantial severity (causing chronic limitation of activity, or days of activity restriction in the 4-week recall period, or regular or occasional doctor visits, or hospitalization, or other days of activity restriction in the calendar-year recall period) 24 percent were not reported until the chronic condition checklist (Q. 16) was presented, and the remaining 7 percent were reported in response to the list of chronic symptoms (Q. 17).

Summary

General questions about illness and chronic conditions do not produce complete reporting. The San Jose and California Health Surveys provide evidence that reporting is increased by questions about action taken as a result of illness and chronic conditions, by checklists of symptoms of illness and chronic conditions, and by checklists of names of chronic conditions. One function of additional questions appears to be the provision of examples of the types of phenomena included under the terms "illness" and "chronic condition." This often enlarges the frame of reference to embrace a wider range of phenomena, many of which may not seriously affect the individual's behavior. Another function of additional questions, especially those directed to behavior associated with illness, is to remind the person of illness or chronic condition which caused the behavior. Such behavior may often have greater saliency than does the illness which instigated it. (Another factor which may affect illness reporting, the reporter's own attitudes toward illness, was also explored in the San Jose Survey. The results are equivocal.) [These results are described in Appendix F of the original document.] Some of the areas in which further research and experimentation would be useful are the type, ordering, and number of questions.

TABLE 8

PERCENTAGE DISTRIBUTION OF CHRONIC CONDITIONS BY QUESTION TYPE ELICITING RESPONSE, ACCORDING TO LEVEL OF SEVERITY: CALIFORNIA HEALTH SURVEY, MAY 1954-APRIL 1955

Question type	Total chronic conditions	Level of severity	
		Substantial	Moderate ² or no reported effects ¹
All questions (Q. 8-18)-----	100	100	100
4-week recall of sickness, injury, and medical care (Q. 8-13)-----	30	41	16
Sickness and injury (Q. 8-11)-----	18	26	8
Medical care (Q. 12-13)-----	12	15	8
Chronic conditions and impairments (Q. 14-17)-----	69	58	83
Chronic condition question (Q. 14)-----	19	19	18
Impairment question (Q. 15)-----	8	7	9
List of specific chronic conditions (Q. 16)-----	32	24	42
List of specific chronic symptoms (Q. 17)-----	11	7	14
Calendar-year hospitalization (Q. 18)-----	0	0	0
Not ascertained-----	1	1	1

- ¹ One or more of the following factors; (a) causes some chronic limitation of activity, (b) regular or occasional doctor visits, (c) caused some days of activity restriction in 4-week recall period, (d) hospitalization or other days of activity restriction in calendar-year recall period.
- ² None of the factors in footnote 1, but one or more of the following; (e) causes regular or occasional taking of medicine or treatment, (f) caused illness without activity restriction in 4-week recall period, (g) hospitalization prior to calendar-year recall period.
- ³ None of the factors named in preceding footnotes.

Evidence so far has indicated that questions which better define morbidity concepts as well as naming specific morbidity conditions increase reporting. Checklists of chronic conditions have been used in a number of surveys, but the use of checklists of illnesses has received less attention and deserves further consideration. Use of a checklist of the more common acute illnesses, for example, might lead to more complete reporting of conditions of interest. Questions about visiting doctors and the taking of medicines jog the respondent's memory about ill-

ness. It may be that questions about other actions, such as staying away from work, indoors, or in bed, would also serve as memory probes to aid in recalling the associated illness.

For illnesses and chronic conditions separately, general questions have preceded the questions about behavior associated with morbidity and the presentation of checklists. General questions have been presented first to give the respondent an opportunity to apply his own definition of morbidity before proceeding with more specific questions. There is no experimental evidence which justifies this approach.

Experience with morbidity surveys has shown that increased probing increases the yield of conditions reported. Decisions as to the maximum number of questions have been based on judgment, not on experimental results. Experimentation with a longer set of morbidity recall questions would appear to be in order.

It will be recalled that morbidity conditions were broken into two categories: chronic conditions and illnesses. Illnesses were further subdivided into acute illnesses and chronic illnesses. While dichotomizing morbidity conditions is a necessary convenience, the line of demarcation between chronic condition and illness is not distinct. Likewise, the distinction between acute illness and chronic illness is not clear cut. With advances in the conceptualization of morbidity phenomena, one would expect that categorization would be replaced first by ordinal rankings and eventually by measurement data. Such refinements in the nature of the morbidity concepts may require corresponding changes in the questionnaire and other operational procedures for measuring morbidity.

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SIGHTED CHILDREN'S PERCEPTIONS OF BLIND CHILDREN'S ABILITIES*

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INTRODUCTION

Literature on adjustment of the blind suggests that a devaluation of the abilities of the blind by sighted persons is responsible for some of the adjustment problems faced by the blind. To the extent that sighted persons' perceptions of the abilities of the blind are accurate, it is unrealistic to hope to change them; however, an underestimate of the actual capabilities of the blind is said to underlie the devaluation. The recent expansion of public school education of blind children, whereby sighted children have personal experience with blind children, offers an opportunity to test the effects of increased knowledge on sighted children's perceptions of the abilities of the blind.

PURPOSE

The purpose of this study was to examine sighted children's perceptions of some abilities of blind children and to determine some factors which influence these perceptions. The following problems were explored:

- 1) Do sighted children's perceptions of the abilities of blind children vary as a result of having actually known and been in school with blind children?
- 2) Do these perceptions vary with the community in which sighted children live?
- 3) Do these perceptions vary with grade level of sighted children?
- 4) What specific activities are commonly perceived as highly possible or highly improbable for blind children to perform?

SUBJECTS AND METHOD

The sample was comprised of 232 sighted children, grades three

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through eight. Of the total subjects, 117 had known and attended public school with blind children, while 115 had never known a blind child. Children from rural, suburban, and urban schools from the Midwest and the West Coast were included.

A 50-item questionnaire was devised which listed activities assumed to be within the capabilities of sighted children in grade three or above. The subjects were asked to consider whether they believed a blind child their own age could persorm each activity, and check *yes*, *no*, or *not sure*.

Each subject's questionnaire was given a numerical score which represented the general positiveness of his perceptions of the capabilities of blind children. The following scoring was used: +1 point for each *yes* answer; 0 points for *not sure*; and -1 point for *no*.

Responses were tabulated for each item and the percentages of *yes*, *no*, and *not sure* judgments were recorded by grade level, type of community in which subject lived, and the number of blind children known.

RESULTS

Results are presented for each question posed.

Do sighted children's perceptions of the abilities of the blind vary as a result of having known blind children?

The responses of subjects in grades three through six (N=92, mean grade=4.6) who had not known a blind child were compared with responses of those subjects, grades four through five, who had attended public school with blind children (N=93, mean grade=4.7). Table 1 shows the tabulation of these two groups.

TABLE 1
RESPONSES BY SIGHTED CHILDREN WHO HAD KNOWN
AND WHO HAD NOT KNOWN BLIND CHILDREN

	<i>Item Responses</i>						
	<i>Yes</i>		<i>Not Sure</i>		<i>No</i>		<i>Total</i>
Had Known Blind Children (N=93)	1798	39%	1071	23%	1754	38%	4623
Had Not Known Blind Children (N=92)	1360	30%	898	20%	2291	50%	4549

It is evident from Table 1 that those children who had known blind children perceived them as being somewhat more capable than did those subjects who had not known blind children. Fifty percent of the latter's responses concerning a child's ability to perform a given activity were *no* and only 30 percent of their responses were *yes*. Those who had known blind children said *no* only 38 percent of the time and *yes* 39 percent of the time.

As seen in Table 2, the subjects who had known blind children were more positive in their appraisals of blind children's abilities than were those who had not known blind children. ($\chi^2=22.15$; $df=3$; $p < .001$).

TABLE 2
SCORES OF SUBJECTS WHO HAD AND HAD NOT
KNOWN BLIND CHILDREN

	N	Numerical Scores Obtained on Questionnaire				Total
		<-30 Points	-11 to 30 Points	+9 thru +10 Points	+9 Points	
Had Known Blind Children	93	0	15	57	21	93
Had Not Known Blind Children	92	13	28	41	10	92

$\chi^2=22.15$; $df=3$; $p < .001$

Comparisons among responses of 69 fifth grade children (all in the same school) based on the number of blind children known is shown in Table 3. The number of blind children known ranged in this group from one to ten.

TABLE 3
SCORES OF CHILDREN BASED ON NUMBER OF
BLIND CHILDREN KNOWN

Numerical Scores on Questionnaire	Number of Blind Children Known		
	1-3	4-5	6-10
Above 0	5	13	20
Below 0	15	10	6

$\chi^2=12.89$; $df=2$; $.005 > p < .001$

Sighted children's perceptions of the abilities of blind children not only are more positive if the sighted children have

known blind children but become still more positive as the number of blind children known increases.

Do the perceptions of blind children's abilities vary with community?

Comparisons between the scores of 59 urban children (mean grade=4.5) and 33 rural children (mean grade=4.9), none of whom had known any blind children, are presented in Table 4. The two

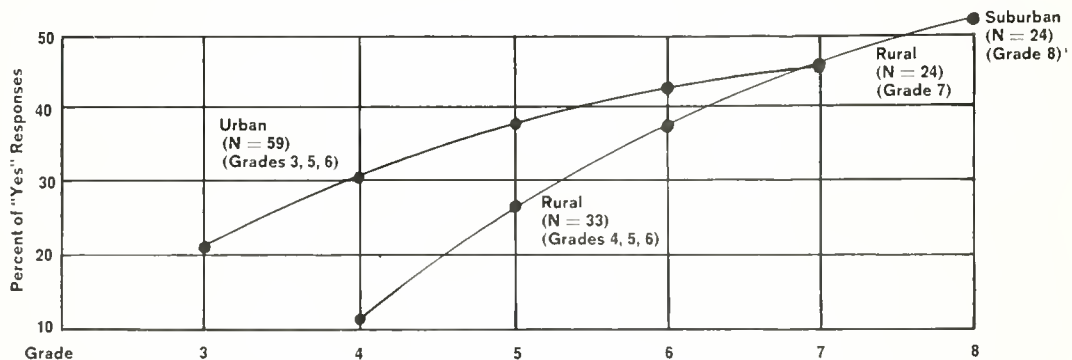
TABLE 4
SCORES OF RURAL AND URBAN CHILDREN

	<i>Numerical Scores on Questionnaire</i>		
	<i>Below -10 Points</i>	<i>Above -10 Points</i>	<i>Total</i>
Rural	21	12	33
Urban	20	39	59
	—	—	—
	41	51	92

$$\chi^2=6.37; 1df; p<.01$$

(Yates Correction Applied)

midwestern communities represented are located about 15 miles apart. The rural-urban differences shown in Table 4 may also be seen graphically in Figure 1.



*Only the eighth grade children had known blind children.

Figure 1. Positive Responses by Grade Level of Children Who Had Not Known Blind Children

Do these perceptions vary with grade level? As shown in Figure 1, there is a trend for the percentage of favorable responses to increase with grade level. This trend is seen for all three groups presented: (1) rural children (grades four through seven) who did not know blind children, (2) urban children (grades three

through six) who did not know blind children, (3) suburban children (grade eight) who had known blind children. The tendency toward increased positiveness of appraisal of blind children's abilities appears to level off at the upper grade levels.

What specific activities are commonly perceived by sighted children as being highly possible or highly improbable for blind children to perform? Since responses to items varied with acquaintance with blind children, locale, and grade level, as shown, it was decided to present item response data for two groups of fifth grade children - those who had not known blind children (N=17, total items answered *yes*=38.5 percent), and those who had known blind children (N=69, total items answered *yes*=38.8 percent), subdividing the second group into three subgroups on the basis of the number of blind children known. Table 5 shows only those

TABLE 5
RESPONSES^a OF FIFTH GRADERS TO SELECTED ITEMS

	N's = 17 20 23 26			
	No. Blind Children Known: 0 1-3 4-5 6-10			
Item				
Dress himself or herself for school	+ ^b			
Comb his or her own hair	+			
Write his own name with a pencil	+			
Erase a blackboard	+			
Swim in a swimming pool	- ^c			
Enjoy television	-			
Tell time	-			
Pay for groceries	-			
Take a trip alone on a bus	-			
Jump rope	-	-		
Play checkers	-	-	-	
Play hide-and-seek	-	-	-	
Ride a bicycle in a field	-	-	-	
Paint a picture of a cloud		-		
Wash dishes		-		
Set the table		-	-	
Build a fire		-	-	-
Model with clay	+		+	+
Type a letter	-		+	+
Play the piano		+	+	+
Find his own desk at school		+	+	+
Put his own clothes away			+	+
Call a friend on the telephone				+
Have fun at a carnival				+

^a If no mark appears for a given group, this indicates that between 25 percent and 75 percent stated "yes," a blind child could perform the activity.

^b (+) More than 75 percent of the subjects stated "yes."

^c (-) Less than 25 percent of the subjects stated "yes."

items which more than 75 percent of the children in each specified group believed a blind child could do (+) and those which less than 25 percent thought possible (-). If no notation occurs in the table, there was lack of unanimity of opinion within the group and between 25 percent and 75 percent of that group believed that a blind child could perform that activity. Items on which all four groups agreed are not shown in the table, but included the following.

More than 75 percent in each group believed a blind child could make up a poem and go on a picnic. These were the only two items of the 50 given which were believed possible for a blind child by more than three-quarters in each group.

Less than 25 percent in each group believed a blind child could roller skate, make a model airplane, play baseball, cross a street alone, ice skate, play tag out-of-doors, or climb a tree.

The items of greatest uncertainty (i.e., those which less than 75 percent but more than 25 percent of each group thought a blind child could perform) were: pour milk, butter toast, pick a bouquet, help wash a car, help decorate a Christmas tree, feed a dog, and find a marble he dropped.

The responses shown in Table 5 indicate:

Those sighted children who had not known a blind child expressed greater certainty (or unanimity) in their responses than did those who had known blind children.

Those who had known the greatest number of blind children were the most positive in their appraisals of blind children's abilities.

The group which had known one to three blind children was the most negative (in terms of proportion of items they agreed could not be performed by a blind child) in their appraisals.

Of the items shown in Table 5 (those from the total 50 on which the groups differed in their responses), acquaintance with blind children (1) clearly resulted in more positive appraisals in 15 tasks; (2) resulted in less positive appraisals for 5 tasks; (3) resulted in ambiguous differences for 4 tasks (on each of these 4, children who had known one to five blind children were less positive than those who had known none or more than five).

SUMMARY AND DISCUSSION

A questionnaire listing 50 activities believed to be within the capabilities of third grade children was administered to 115 sighted subjects who had not known a blind child and to 117

sighted subjects who had known and attended public schools with from 1 to 10 blind children. The subjects indicated whether they believed a blind child their own age could perform each of these tasks.

An analysis of their responses and comparisons on the basis of number of blind children known, kind of community (rural-urban), and grade level suggested:

- 1) Those subjects who had known blind children were more positive in their appraisal of the abilities of blind children than were those who had not known blind children. Within the group who had known blind children, the positiveness of appraisal increased with the number of blind children known.
- 2) Urban children were more positive in the appraisals than were rural children.
- 3) Positiveness of appraisal increased with grade level from grades three through eight, most noticeably in grades three through six, with a tendency to level off in grades six through eight.

Since no attempt was made to determine whether or not "a blind child" could in fact perform these activities (it is believed by the investigator, however, that all of the items, except the validity checks, could be performed by some blind children under some circumstances or with slight modifications) it is not possible to discuss the accuracy of these sighted children's perceptions.

Specific item responses of interest to the investigator included:

- 1) Most sighted children believed that blind children could not roller skate when in fact this is a popular activity at many residential schools for the blind.
- 2) Children who did not know blind children believed that they could not swim in a pool, enjoy television, tell time, or play the piano - all common activities for the blind - and they thought blind children could write their names with a pencil - a difficult task even for blind adults.

Support was found for the contention that personal knowledge about blindness (acquaintance with a recognizably select group of blind children - those attending regular public schools) does broaden sighted children's ideas of the capabilities of the blind.

To the extent that this is true, further public education about blindness would decrease the apparent tendency for the sighted to underestimate or devalue the abilities of the blind persons. The fact that the children who had no experience with the blind expressed greater certainty and unanimity in their evaluations indicates that increased knowledge may decrease the tendency to make absolute judgments and generalizations.

The finding that increased personal experience with the blind does seem to change attitudes held about their capabilities suggests that this area could be profitably explored further in terms of stereotyped concepts - their acquisition and change.

Interesting speculations are suggested by the finding that rural children were more negative or devaluating in their appraisals than were urban children. Are rural children more prone to accept negative stereotypes than urban children, or is this simply a reflection of possibly broader general experiences generally obtained in an urban setting?

Further research could be profitably conducted both in the area of attitude formation and change related to stereotyped concepts about the handicapped and in the area of the accuracy of the perceptions of the abilities of the blind held by the sighted.

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READING AND PSYCHOLINGUISTIC PROCESSES OF PARTIALLY SEEING CHILDREN*

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RESULTS: THE ILLINOIS TEST OF PSYCHOLINGUISTIC ABILITIES

The Illinois Test of Psycholinguistic Abilities (ITPA) was administered to 93 partially seeing children, grades one to three, to determine how their performance on this test differed from that of normally seeing children. The standardization group upon which the ITPA norms were established (N=700) was presumed to represent a normal group. The following analyses were made on the standard scores obtained by the partially seeing children from the ITPA chronological age norms.

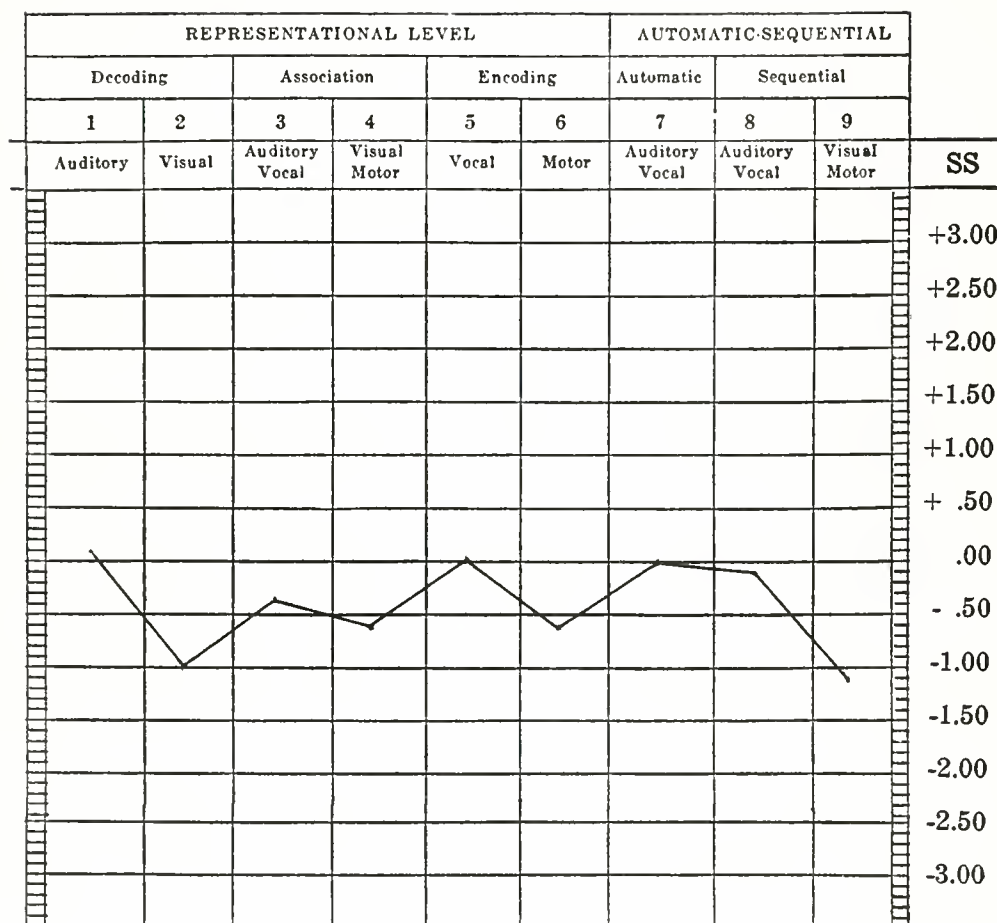
Psycholinguistic Subtest Scores

The group mean standard scores of the partially seeing children on the nine subtests of the ITPA are presented in profile form in Figure 1.

Table 1 presents the mean standard scores for the partially seeing group based on the chronological age norms, the standard deviations, and t 's based on the comparison of the partially seeing group with the standardization group. Mean standard scores for the partially seeing children based on their mental ages (in parentheses) are also presented.

The presentation of mental age scores was considered desirable because of the difference in mean IQs between the standardization group (mean IQ=103.6, ages 7-9) and the partially seeing group. Since this difference is not statistically significant, an analysis of covariance was not necessary. On each subtest the mean MA score is either not different from the mean CA score or is raised slightly (due to the fact that the standardization group mean IQ was higher than that of the partially seeing children in this study).

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Total Group (N = 93)

Figure 1. Group ITPA Profile

TABLE 1

COMPARISON OF ITPA STANDARD SCORES OF PARTIALLY SEEING
CHILDREN (N=93) AND TEST STANDARDIZATION GROUP (N=700)

<i>Subtest</i>	<i>Mean</i>		<i>Standard Deviation</i>	<i>t</i>
	<i>CA</i>	<i>(MA)</i>		
Auditory-Vocal Automatic	+ .01	(+ .08)	1.00	.096
Visual Decoding	- .945	(- .94)	1.18	7.68**
Motor Encoding	- .695	(- .66)	1.03	6.50**
Auditory-Vocal Association	- .275	(- .22)	1.07	2.48*
Visual-Motor Sequential	-1.095	(-1.06)	.96	10.95**
Vocal Encoding	+ .05	(+ .07)	.95	.51
Auditory-Vocal Sequential	- .11	(- .06)	1.19	.89
Visual-Motor Association	- .640	(- .60)	1.07	5.76**
Auditory Decoding	+ .10	(+ .10)	1.10	.88
Total Language Age	- .740	(- .685)	1.19	5.96**

* $t = 1.987$; 92 df ; $p = .05$

** $t = 2.631$; 92 df ; $p = .01$

Auditory Decoding Subtest

The partially seeing children scored as did the normals on this measure of deriving meaning from the spoken word. In view of the fact that an emphasis on oral work and listening activities is often advocated in special programs for these children, it might be expected that they would be superior to other children in auditory decoding. The fact that they do not differ might suggest that they had not actually received extra training in this area, that the process as measured by this subtest is not readily influenced by extra experience, or that the subjects' presumed lack of visual familiarity with some of the objects named in the test

is simply compensated by an actual superiority in auditory decoding.

Visual Decoding Subtest

The mean standard score for the partially seeing group was almost a standard deviation below the normals, showing a clear and significant deficit in obtaining meaning from visual symbols (pictures). This deficit could be the result of either or both of two factors: (a) the children lacked a background of visual experience with the objects pictured, or (b) they were unable to perceive the pictures of the objects clearly. An examination of picture clarity and of the items frequently missed suggests that in most cases the children either were unfamiliar with the objects, or the pictures showed otherwise familiar objects from an unfamiliar perspective. Items frequently missed included a boat seen from a bird's eye view, a partially opened jackknife, a hacksaw, an air pump, and a hydraulic jack. The examiner queried several children after the test concerning certain pictures, and their responses indicated a lack of familiarity with the objects presented rather than an inability to see the pictures. All children knew they were free to use a magnifying glass or a projector if necessary, but none so requested. The subjects did not appear to need additional viewing time, or to feel it would have helped them.

Auditory-Vocal Association Subtest

The mean standard score in this verbal analogies test was $-.275$. Although this finding was statistically significant ($p < .05$), further study is necessary in order to offer a reasonable explanation in the event that the difference is other than statistical. When the mean standard score of $-.22$, based on mental age, was used, the difference was not statistically significant ($p > .05$).

Visual-Motor Association Subtest

The partially seeing children were significantly below the normals on this measure of the ability to make associations between visual stimuli. Visual discrimination of pictures in this subtest appeared to present some problems for many of the partially seeing group. For example, many of them pointed to the paper clip rather than the safety pin as the object associated with the baby, and many of them indicated that a cigarette went with a horse, thinking the former to be a bale of hay, as revealed in subsequent questioning. Another factor which may have influenced the group score was that the "majority" response from the standardization group was designated the "correct" response. In a sense, then, this subtest is a measure of *conformity* rather than *logicality* of association. Many children, for example, indicated that book, rather than table, went with lamp - a response which

seems quite correct for this group, and yet was necessarily scored as incorrect.

Vocal Encoding Subtest

On this test of verbal expression the partially seeing children did not differ from the standardization group. Some superiority in this test might have been expected, as was discussed previously under auditory decoding, but it either did not exist or was not evident for the reasons given earlier.

Motor Encoding Subtest

The mean group standard score on this measure of motoric expression of ideas was significantly below normal. This subtest, more than any other in the visual-motor channel, appears to pinpoint the nature of the visual channel deficit shown by this group of partially seeing children. Since standardized procedure allowed the examiner to name the object whose use was to be demonstrated by the subject (if he hesitated to respond or requested the name) the problem of visual perception or visual discrimination of test materials was eliminated. The deficit in this area thus points to a lack of knowledge of the objects' use - knowledge which is usually gained by visual experience. This may be illustrated by the fact that, as a group, these children were unable to demonstrate the playing of a trombone. Although few normally seeing children of this age have actually played the instrument, they have seen it played and have seen it clearly enough to recognize the instrument and to reproduce the gestures involved. The partially seeing children were unable to do this even though the instrument was named for them. An interesting observation on this subtest was that the children who misperceived the hand drill as being an egg beater (as revealed in later questioning) and so demonstrated it, scored higher than did those who hesitated or asked what it was and were told it was a "drill." A further sidelight was that almost 100 percent of the partially seeing children successfully demonstrated the binoculars, perhaps suggesting that parents had made a special effort to expose these children to this device.

Auditory-Vocal Automatic Subtest

The partially seeing children scored no differently than normals on this grammar subtest, as would be expected.

Auditory-Vocal Sequential Subtest

The partially seeing children did not differ from normals on the auditory-vocal sequential subtest, showing no "compensative superiority" in immediate auditory sequential memory. This finding is similar to that obtained with the blind, notwithstanding the

popular misconception to the contrary. Livingstone (1), as mentioned earlier, also found no difference between partially seeing children and normals on digit memory on the Binet.

Visual-Motor Sequential Subtest

The partially seeing children's greatest deficit was found in the area of sequential memory for visual symbols. The nature of the test material (single line geometric figures about an inch in height) decreased the possibility that this deficit was due to difficulty in visual discrimination per se. It appeared to the examiner that the children needed more than the five-second viewing time allotted by standard procedure. Limited eye span, which is even further limited by the necessity of viewing the material from a distance of only a few centimeters in many cases, seemed to prevent the children from viewing the entire sequence of designs, particularly when four or more designs were presented.

Since this is a memory task, parallel to digit repetition, designing a procedure to test the effect of increasing the "viewing span" without confounding the "memory span" by the introduction of a learning period would be challenging.

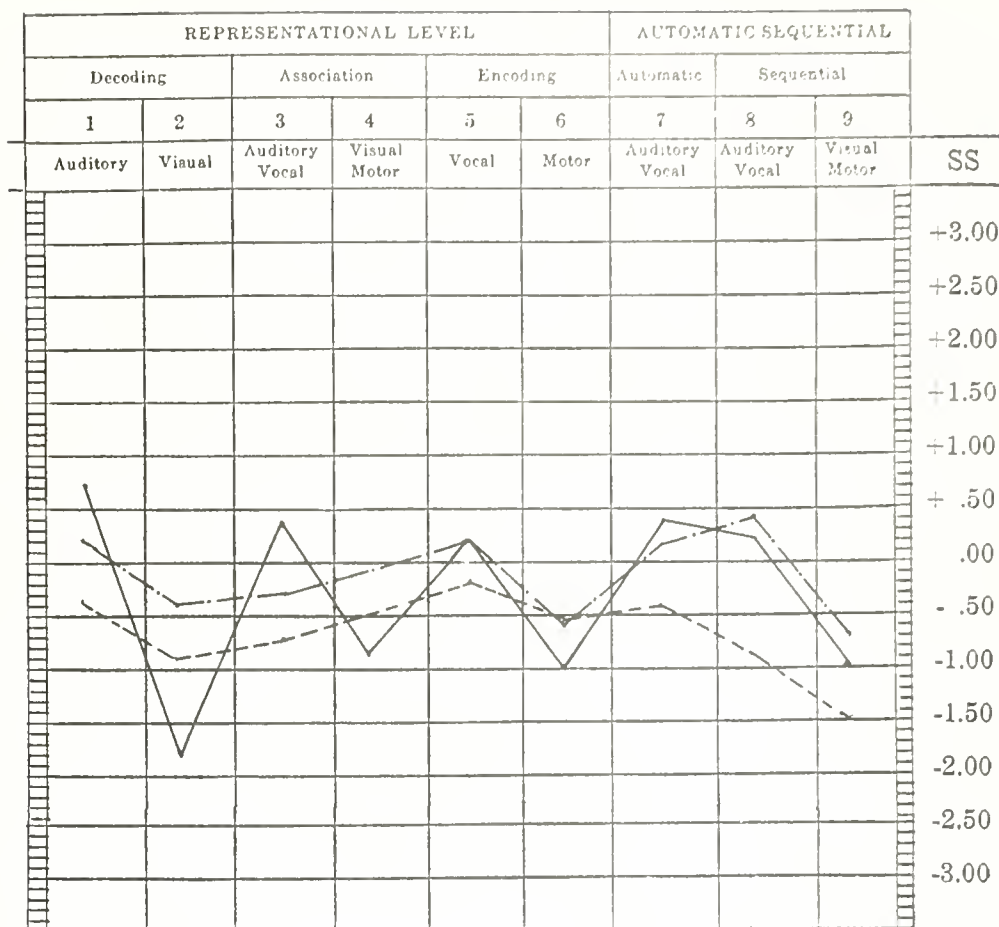
Psycholinguistic Processes, IQ, Grade, Visual Acuity, and Eye Conditions

The ITPA profiles were examined in relation to IQ, grade, visual acuity, and eye conditions. Profiles drawn for those partially seeing children with IQs above 114 (N=18) and those with IQs below 84 (N=14) paralleled each other almost exactly except that the low IQ group showed a greater deficit in the auditory-vocal association area than would be expected from the rest of the profile. It may be that the total group (N=93) mean standard score of $-.275$ on auditory-vocal association was reflecting a disproportionate lowering by the lowest IQ members.

No relationship was found between grade level and performance on the ITPA. The possibility exists that if classes for the partially seeing were successful in teaching these children to increase their visual channel efficiency or effectiveness, the result of longer classroom experiences would be seen as decreased deficits in this channel. However, these decreases were not found.

Figure 2 presents the ITPA profiles for subjects with (a) mild visual defects (N=33), (b) moderate defects (N=31), and (c) severe defects (N=24).

The relative elevations in the profiles (disregarding the marked visual channel deficit of the severe defect group) are apparently a function of the differences in intelligence between



LEGEND

- Mild Visual Defect
- .-.-.-.-.- Moderate
- Severe

Figure 2. ITPA and Degree of Visual Defect

the three groups. The mild and moderate defect profiles parallel each other on all subtests with the exception of motor encoding and auditory-vocal sequencing. Auditory-vocal sequencing is negatively related to chronological age ($r = -.45$) and the average chronological age of the mild group was 109.2 months, compared to 100.5 for the moderate group and 97.2 months for the severe defect group. Why the older subjects might have had more difficulty with auditory sequencing than did the younger ones is difficult

to determine, unless this ability is highly important in educational achievement and those deficient in it were older as a result of educational retardation, having been likely prospects for special class placement with minimum qualifications - in this case, very mild visual defects.

Although all of the groups were low in motor encoding, this was the only subtest in which the mild defect group scored higher than either of the other two groups. As was discussed previously, visual defect perhaps affects motor encoding by limiting the child's visual experiences of his nonimmediate environment. The child with the mild visual defect was least limited in this regard.

The subtests which correlated most highly with intelligence were auditory-vocal association ($r = +.68$) and auditory-vocal automatic ($r = +.68$). It was on these subtests, plus auditory decoding, that the differences in intelligence among the three groups were most clearly seen.

The visual channel deficit shown previously in the total group ($N = 93$) ITPA profile, Figure 1, is seen in Figure 2 to be largely attributable to the small group of severe visual defect children, most of whom were legally blind. Even though the mild and moderate defect groups still score below the standardization group on the visual channel subtests when scores are based on the mental ages of the partially seeing subjects, it is clear from the profile that they manifest generally lower performance on all tests, and clinically do *not* show a visual channel deficit; i.e., visual subtest performance is not strikingly or consistently lower than auditory subtest performance.

The profiles of the mild and moderate defect groups (vision 20/20 through 20/200) suggest that the ITPA is suitable for use with the visually handicapped, and that the visual processes involved in this test are not exclusively peripheral. The severe and moderate defect groups performed better than the mild defect group on the visual-motor sequential subtest. However, when subjects with less than 20/200 vision are tested, an allowance should generally be made for lowered visual channel performance.

Profiles were drawn for each eye condition and several combinations of conditions. Since the number of cases represented on each profile was small the profiles are not presented here. The children with cataracts and retrolental fibroplasia showed highly similar profiles and both presented clear cases of visual channel deficit, as they were among the most severely visually handicapped. The effect of their profiles was seen in the contrast between the total refractive and nonrefractive group profiles. The refractives, who were less severely handicapped, showed no major visual channel problems.

Children with refractive errors showed no deficit in visual-motor association, suggesting that with visually handicapped children who are not legally blind (as the great majority of refractives are not), this subtest was measuring central processes that were relatively unaffected by sensory loss. The lack of discrimination between the types or degree of visual problems shown by the tests of motor encoding (except as discussed earlier) and visual-motor sequential abilities suggests that the lowered performance in these areas was a function of limited visual experiences, not of the test material. It thus appears that visual decoding was the only subtest which was clearly affected by the difficulty in performing the visual task required or presented by the test material itself.

In general, it may be said that degree of visual defect, rather than type of eye condition, exerts the greatest influence on the ITPA profiles of these partially seeing children.

Psycholinguistic Processes and Reading

The relations between both reading achievement and error types in reading and performance on the ITPA were studied. In addition to these analyses, several case histories are presented as illustrations of these relations.

Reading Achievement

Both reading test scores and ITPA scores were available for 59 partially seeing subjects. When the discrepancy between mental age and reading age was used as the index of reading achievement, no significant correlations were found between reading and performance on the ITPA. However, mental age is not considered an adequate single criterion for the evaluation of reading expectancy for these children [discussed in Section 4 of the original document].

When grade placement was used as the criterion for reading, and correlations were computed using the deviation of reading grade from grade placement, reading achievement was found to be positively related to the auditory-vocal sequential subtest ($r = +.44$), visual-motor sequential subtest ($r = +.35$), and the auditory-vocal automatic subtest ($r = +.43$). The second graders were excluded from this analysis since the reading tests were administered to the more advanced readers only. The N was thus reduced from 59 to 42.

Psycholinguistic Subtests and Error Types

Correlations were computed between each error type and each ITPA subtest. It was not necessary to exclude the second graders

from this analysis, since error standard scores are based on average reading grade. Only 12 of 110 correlations were significant ($p < .025$), and all of these correlations were very low ($r = .25$ to $.30$).

The relations discussed in the following section are merely suggestive and are not to be considered as necessarily or generally applicable. However, as will be shown in illustrative case history material, these relations may be crucial in individual cases. Restandardization of the error type norms and the use of a larger sample would be necessary to justify a more vigorous statistical treatment of these data (e.g., factor analysis).

Auditory-Vocal and Visual-Motor Sequencing

Auditory-vocal sequencing subtest scores were positively related to high words aided and refused ($r = .28$). This may be a result of the relation between high reading achievement and auditory-vocal sequencing. Possibly the better readers are more reluctant than the poor readers to read an unknown word incorrectly. If this were so, a negative correlation of approximately the same magnitude would be expected between substitutions and auditory-vocal sequencing. Such a correlation was found ($r = -.30$). Substitutions also were correlated ($r = -.26$) with visual-motor sequencing. Consonant errors were negatively correlated with both auditory-vocal and visual-motor sequencing ($r = -.27, -.25$). As was suggested earlier, consonant errors may reflect general level of reading better than do other types of errors, and as noted in the preceding section, both sequencing subtests were also positively related to reading achievement ($r = +.44, r = +.35$). Of the twelve significant correlations found, five involved one of the sequencing subtests, suggesting that sequencing is more directly related to reading than are other abilities measured by the ITPA.

Motor Encoding

High motor encoding was related to high vowel errors ($r = +.28$) and to low words aided and refused ($r = -.29$). A personality factor or pattern could operate similarly to facilitate motor encoding performance and to make a child reluctant to sit passively and wait to be told an unknown word. No reason for a genuine relation between high motor encoding and high vowel errors was discernible.

Auditory Decoding

Auditory decoding correlated positively with high repetition errors ($r = +.29$), suggesting that the child who operates on a level of high understanding of the spoken word, as a child high in

auditory decoding ability does by definition, also insists on obtaining meaning from material he reads orally and often resorts to repeating himself in order to get the meaning of difficult material.

Total ITPA Scores

The ITPA score was negatively related to substitution errors ($r = -.26$) and to consonant errors ($r = -.30$). These relationships would logically follow from assuming that the better readers tend to make fewer *basic* errors (substituting entire words and confusing consonants) than do poor readers, and that those who have the highest overall language performance are the better readers.

Case History Material

The ITPA is a new test, and as yet has not accumulated an extensive background of "clinical lore" regarding its use with individual cases. Below are a few case histories chosen to illustrate the ways in which the ITPA and the Monroe reading analysis can supplement each other, to exemplify points mentioned in earlier discussion, and to show the inevitable exceptions to the generalizations derived through a study of this type.

Case 1

TM, male, third grade, IQ 109, MA 9-6, CA 8-8. Cataract in right eye, nystagmus. Limited field. Visual acuity in right eye 20/75; left eye, light perception only. Showed extreme difficulty in visual tasks.

TM's ITPA profile (Figure 3) shows a severe visual channel deficit. Only two or three other subjects presented a profile so clearly indicating the visual difficulty. Yet, even with the magnitude of the visual channel deficit, visual-motor sequencing is up to the level of the auditory-vocal channel. This profile supports the observation that performance on the visual-motor sequencing subtest does not necessarily depend on peripheral visual functions. Since the auditory-vocal automatic, auditory-vocal sequential, and visual-motor sequential subtests, which constitute the automatic-sequential level and correlate with reading, are high, we might expect that TM, in spite of his severe visual problem, would be capable of reading up to grade level.

TM's grade placement scores and error profile indicate that he is reading almost a year above his grade level, makes no more total errors than the test standardization group, and many fewer errors than the partially seeing or the comparison groups. When he does not know and cannot sound out a word, he waits to be told the word and thus he makes few errors of any type other than words aided and refused.

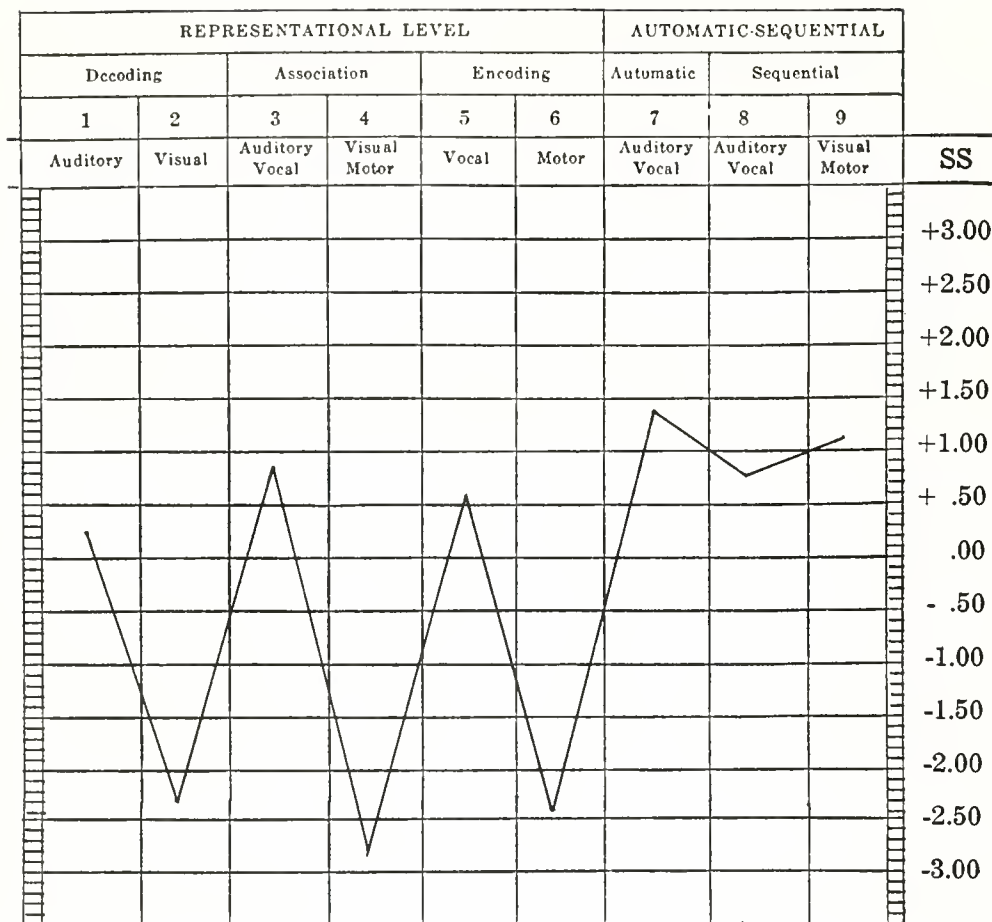


Figure 3. TM

Case 2

CS, male, third grade, IQ 105, MA 8-6. Has myopia, visual acuity 20/30 in both eyes. Evidenced no visual difficulty in any task.

Although CS's ITPA profile (Figure 4) shows some discrepancy between visual-motor sequential and other subtests, his deficit appeared clinically to be primarily a decoding process problem, rather than a channel difficulty.

He read almost two years above grade level and made few total errors compared to the total partially seeing group. The question may be raised as to why this boy was placed in a special program for visually handicapped children. A partial answer may

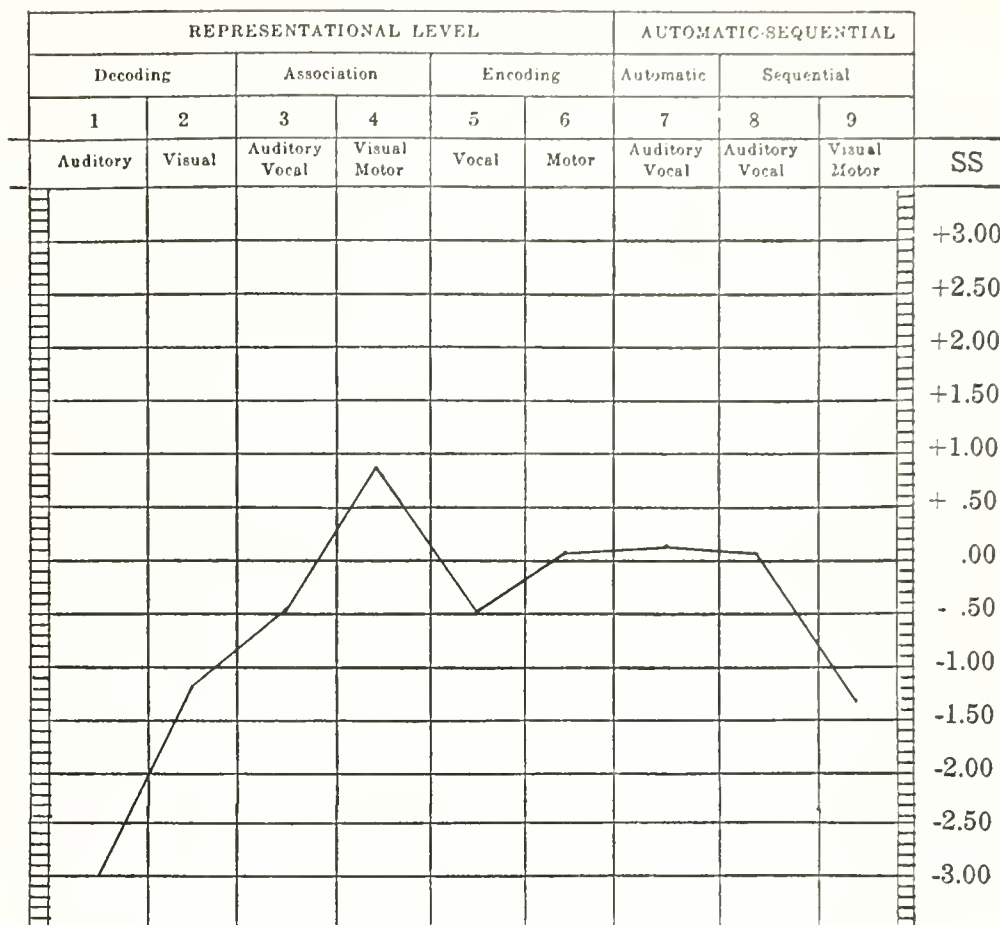


Figure 4. CS

be found in his ITPA auditory decoding performance. He responded incorrectly to these questions: Do pincushions cheer? Do daughters marry? Do dials yawn? Do frankfurters frown? His language age on this subtest was below four and one-half years. His earliest failure on the Binet was in verbal absurdities, and his lowest reading grade was in comprehension of silent reading.

We often think primarily of reading achievement as indicative of school standing, but in the case of CS, it is clear that how well one understands verbally presented material is also very important. In spite of his excellent reading performance, CS was seen by the school personnel as a child who was having such difficulty with his schoolwork that special class placement was necessary.

Case 3

MH, female, third grade, IQ 73, MA 6-0, CA 8-2. Optic atrophy, visual acuity 18/200 both eyes (legally blind).

This ITPA profile (Figure 5) presents a combination of visual channel and encoding process loss, with auditory-vocal automatic intact and the sequential scores not as deficient as visual decoding, vocal encoding, and motor encoding. This suggests that reading may not be seriously impaired. Her reading grades were: oral, 2.9; silent, 2.4; word recognition, 3.0; word discrimination, 3.2; average, 2.9. The Monroe profile and scores showed that in fact this child was reading only three months below grade placement and two years above her mental age as obtained on the Binet. The reading comprehension score was one-half year below the other reading test scores, consistent with the higher correlation found between mental age and comprehension as compared with the other facets of reading. And yet, the total reading per-

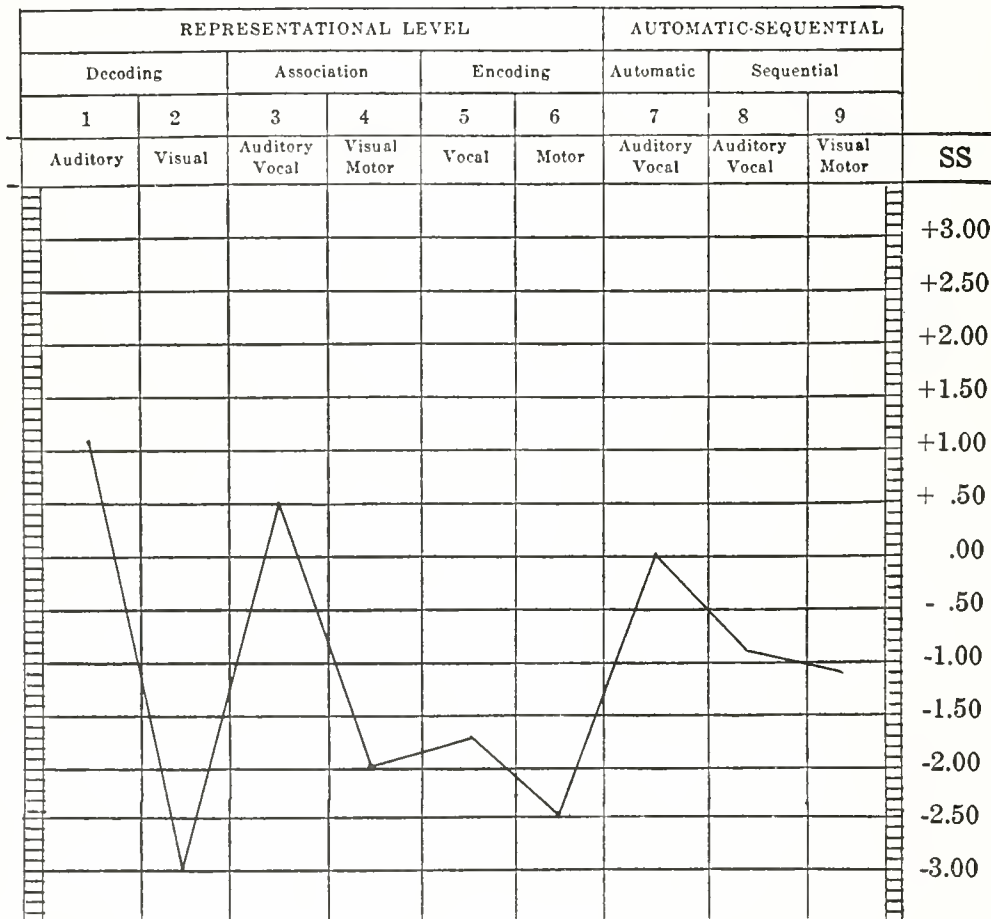


Figure 5. MH

formance suggested that the obtained mental age was too low. The error profile showed that the subject tended to refuse or to substitute words and made few vowel, consonant, and total errors.

If we hypothesize on the basis of the results obtained on the ITPA that MH's basic problem is in encoding and that her performance on the Binet is hampered by this problem, then the high substitutions and refusals become indications that the subject was unable to express a word which she may have decoded quite correctly. The relatively low reading comprehension score may be due to an inability to execute the tasks required on the test, even though the directions may have been thoroughly understood. The Binet performance offered some support for this hypothesis. Her attempts to draw a diamond are shown in Figure 6.

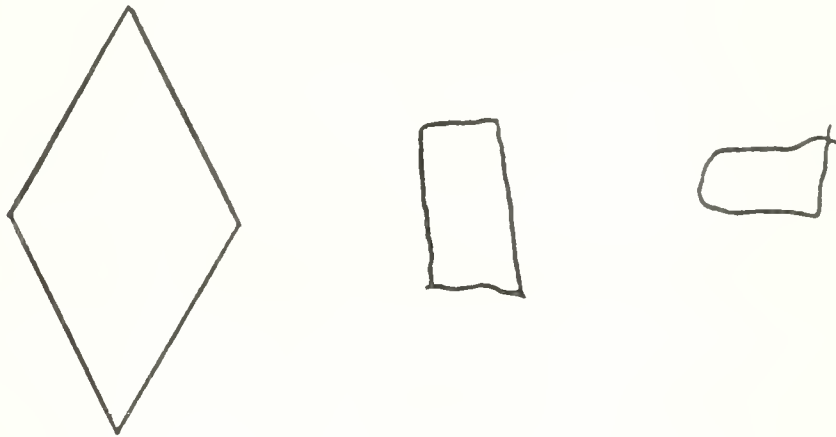


Figure 6. MH-Diamond

The optic atrophy, encoding disability, and the low IQ may all be manifestations of a condition which was medically diagnosed (tentatively only) as a very mild case of cerebral palsy, type unspecified.

Case 4

KM, male, first grade, IQ 122, MA 8-0, CA 6-7. Cataracts, aphakia, capsular remnants. Visual acuity unknown.

KM was blind from birth, according to the report of the teacher, until surgery was performed within the past year. His parents and younger sibling are all blind. For the past year, six-year-old KM has literally served as the "eyes" for his entire

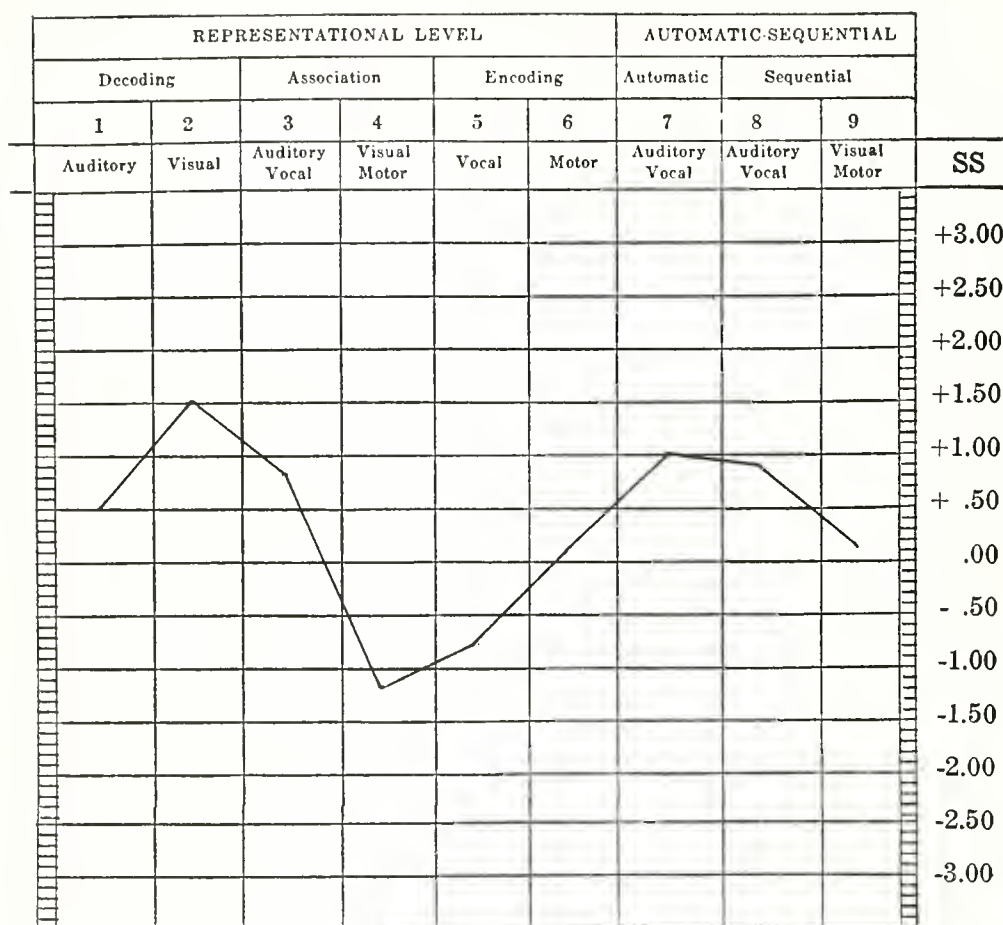


Figure 7. KM

family. His ITPA profile (Figure 7) is extremely interesting. Visual decoding was his highest subtest, while visual-motor association was the lowest. Circumstances have literally compelled KM to learn to understand what he sees - visual decoding - and he has had the mental ability to do this well and rapidly. Yet in spite of his success in doing this, he simply has not had enough visual experiences in his "year of sight" to build up the central visual associations measured by the visual-motor association subtest.

CODE FOR IMPAIRMENT
OF VISUAL FUNCTION*

(Section 300-399 of the Impairment
Code, Revised June 1963)

EDITOR'S PREFACE

In presenting the following Code for Impairment of Visual Function, it will be necessary to add a few explanatory notes regarding the context within which the Code is being developed and also the work in progress toward its refinement. We are indebted to Dr. Maya Riviere, Director, Rehabilitation Codes, for the following information which establishes this context and shows the detailed and painstaking efforts currently under way to refine the Code in actual field testing.

The Introduction to the Code is reproduced from the 1962 Five-Year Progress Report issued by Rehabilitation Codes. The aims and purpose of the Codes are set out in some detail there. Immediately following are some general definitions of terms used in the text which the reader should bear in mind. In addition, the following points should be noted as well:

First, The Code for Impairment of Visual Function was initiated by the Association for the Aid of Crippled Children. This Association has sponsored and cofinanced the work with additional funds from the Vocational Rehabilitation Administration and the Easter Seal Foundation. The Code for Communicative Disorders - Section 200-299 of the Impairment Code - entered upon a five-year program of six national workshops and intensive field testing in 1962. This program was financed by a grant from the National Institute of Neurological Diseases and Blindness (Communicative Disorder Research Training Program) and has as its goal the production of an operational Impairment-Cause-Etiology system; the causes are arranged by pathology grouping.

Second, the members of the subcommittee, shown on pages 67-69 started their work in June of 1960. They had held regular all-day meetings prior to August of 1963; at that time a two-day workshop was held on problems involved in delineation of function levels in persons with diagnosed low vision. During the workshop the participants attempted a "dry run" coding of case materials provided by Dr. Richard Hoover. Besides Dr. Hoover and Dr.

* Permission to reprint this Section of the Impairment Code has been granted by Dr. Maya Riviere, Director, Rehabilitation Codes, Inc., 1860 Broadway, New York, New York.

Riviere, the participants included representatives from the American Center for Research in Blindness and Rehabilitation (Newton, Massachusetts), who organized the meeting; 15 representatives of St. Paul's Rehabilitation Center for the Blind and the Catholic Guild for All the Blind of the American Center staff; the Blind Veterans Association; the Massachusetts Department of Education, Division of the Blind; the American Foundation for the Blind; and Bio-Dynamics, Inc. (Cambridge, Massachusetts).

Third, intensive one-year field tests were started in Autumn of 1963 at the Perkins School for the Blind (Waterbury, Massachusetts) and the American Center for Research in Blindness and Rehabilitation (Newton, Massachusetts). These trials will test also the Impairment Code for Hearing Function; an attempt will be made to relate the incidence of both hearing and visual impairments to the rehabilitation of the doubly disabled trainee. While the field tests are in progress, the subcommittee will continue the tasks set down by the two-day workshop of August 1963, and will try to spell out the kinds of normal functions which the person with a specific low vision diagnosis can carry out safely and effectively. This delineation will lead directly to a specification of direct services, low vision aids, and training required by the impaired individual. The subcommittee will also carry out the recommendation of the workshop that a record form be developed to record the examiner's findings; included will be coding for each eye and for binocular vision, using the Impairment Code where it is relevant for the naked eye, for vision achieved by means of any correction used by the individual, and the new prescription. The new prescription will incorporate procedures for testing and the conditions of test contained in the Appendix of the following Code. Note on page 60 that the entire fraction for distance and near visual acuity is utilized rather than the three-digit code (starting on page 50) which allows only a range of levels of acuity to be recorded.

Fourth, plans are under way for a new workshop. This will be attended by subcommittee members and the members of the Committee on the Definition of Blindness of the National Institute of Neurological Diseases and Blindness. The latter group met in 1962 to clarify ad hoc definitions of "legal blindness," "industrial blindness," etc., but did not continue its work after filing its one-year report. The new workshop hopes to pool the thought of the two groups and discover what need there might be for further work on the entire range of impairment considered by the Rehabilitation Codes subcommittee.

Finally, one important caveat: the present draft is not considered by the committee as operational before additional field testing is done and until the revision of the record form referred to above is accomplished.

All of the Rehabilitation Codes material developed to this date is available to professional personnel and agencies who write on their letterhead for copies. It should be kept in mind, however, that only within the context of the complete Impairment Code can the Visual Code be used effectively, since it may be necessary to code impairments other than visual where a person has incurred additional losses or limitations of function; in fact the visual impairment may not even be crucial in such a case in terms of the most needed rehabilitation services to be provided.

INTRODUCTION

The Rehabilitation Codes are a seven-year project (1957-1964) to develop and field test a system of classifications of information essential to the rehabilitation process. The purpose is to try to improve service by improving communication among the professional staff and between them and the disabled person, his family, and his community. The Codes cover all ages and types of impairment, services, and agencies, and provide a *serial case record* which permits comparison of the disabled person's status at given dates, from first contact through service and follow-up in the community to closure. The code numbering is designed for use with punched card systems where available.

The *Personal History* classifications code the basic demographic, familial, cultural, educational, vocational, and community information.

The *Health History* classifications code the usual level of health and normal function, and the personal and familial medical histories, including the clinical problem requiring rehabilitation.

The *Impairment-Etiology Code*, based on the International Statistical Classification, is designed for rehabilitation, giving single symptoms and groupings of symptoms of impairment, the underlying pathology or cause, and the etiology: it is a joint project with the Surgeon General's Subcommittee on the Physical Impairment Code of the United States Public Health Service National Committee on Vital and Health Statistics.

The *Evaluation-Service Code* describes with equal emphasis the disabled person's disability, handicap, capabilities, achievements, and potentialities, to determine his rehabilitation potential which is the basis for implementing service: these descriptions are entered with the Impairment-Etiology on the *Cumulative Record* form starting with the first evaluation case conference, the code numbers changing thereafter when the disabled person's current status at any reevaluation date indicates that a new description is required.

The Rehabilitation Codes have grown out of the expressed needs of agencies across the country for up-to-date definitions and terminology which embody the newer scientific knowledge and concepts of human behavior (the disabled person has many normal functions - he continues his life not in terms of what he has lost but what he can do): agencies stress the need for more effective case records and recording procedures to secure improved case services; they hope for a staff training tool which will expedite service for case loads increasing out of all proportion to the available trained staff. For these problems the Codes offer:

1. A common language to code the interprofessional discussion of the disabled person's current status and decisions for service;
2. A means of recording the implications of the therapeutic departments' separate findings synthesized in terms of the disabled person's needs, goals, and response to service: the Codes do not replace departmental records but ensure coding case conferences in consistent terminology;
3. A method of currently accumulating data consistently described and interpreted, therefore comparable from one date to another, one case to another, and one agency to another: results of rehabilitation service may thus become available for interagency and national reporting, analysis, research, and program planning and evaluation.

GENERAL DEFINITIONS

Rehabilitation

Both the concept of a disabled or handicapped individual's optimal achievement of his potential for self-realization, and his assistance therein by the community through organized services directed towards that end.

Impairment

Any deviation from the normal which results in defective function, structure, organization, or development of the whole, or of any of its faculties, senses, systems, organs, members, or any part thereof.

Disability

Any limitation experienced by the impaired individual, as compared with the activities of unimpaired individuals of similar age, sex, and culture.

Handicap

The disadvantage imposed by impairment or disability upon a specific individual in his cultural pattern of psychosocial, physical, vocational, and community activities.

An impaired individual is not necessarily disabled or handicapped by the impairment but he may be either disabled or handicapped, or both.

Rehabilitation Potential

The implications of the interplay of all the *pro* and *con* factors revealed in evaluation of the individual's assets and liabilities, which affect his capacity for cooperating with rehabilitation services, and the demands of his living environment.

Normal Function

The normal visual system should have physiological potential with correction for

1. central visual acuity (1 min. of arc. resolving power at *distance* and equivalent acuity at *near*) and have
2. no defect of visual field
3. no defect of ocular motility
4. no defect of binocular vision
5. no defect of color perception

(all tested under accepted conditions) and

6. no ocular defect or malfunction.

Total Impairment

No light perception in both eyes, properly called "blindness."

IMPAIRMENT OF VISUAL FUNCTION

IMPAIRMENT OF CENTRAL VISUAL ACUITY (300-359)

Measurement of Central Visual Acuity

Loss of Organ Resulting in Blindness

Instructions for Coding

300 right eye
310 left eye
320 binocular

To the basic code number, add the range number, replacing the zero shown for *right*, *left*, and *binocular*. Example: 300 becomes 301 to 309 for 9 ranges.

Impairment of Visual Function NEC/NOS*

330 right eye
340 left eye
350 binocular

Each eye should be coded for distance and near vision: right eye and left eye uncorrected and best correction should be entered *separately* on the Cumulative Record unless the function for *both is the same*, as in 329 and 359 (total blindness, both eyes) otherwise the problems where one eye only is seriously involved, as in unocular loss of organ, will not be revealed.

Impairment of Visual Function Specified by 9 ranges (301-359)

distance vision (301-329)

301-309 right eye
311-319 left eye
321-329 binocular

If additional detail is desired, the expanded decimal code in the Appendix (page 60) provides coding the specific measurement in full: this provides both the structure on which the 3-digit code was built and a research tool for specialists working in this particular area of impairment. See pages 56-59 for testing instructions.

near vision (331-359)

331-339 right eye
341-349 left eye
351-359 binocular

* NEC/NOS - not elsewhere covered/not otherwise specified

EQUIVALENT MEASUREMENTS OF CENTRAL VISUAL ACUITY

Range Code No. Range	DISTANCE VISION		NEAR VISION		
	(1) visual angle in minutes of arc subtended at standard test distance (arc/min.)	(2) 20 ft./6 m.	(3) 20/200 Snellen letter with variable test distances	(4) 16 in./40 cm.	(5) 14 in./33 cm.
-1. 1st	0.65- 3.	20/ 13- 60		40/ 26- 120	14/ 9.1- 42
-2. 2nd	4. - 8.	20/ 80- 160		40/ 160- 320	14/ 56. - 122
-3. 3rd	10. - 16.	20/ 200- 320	20-12.5/200	40/ 400- 640	14/140. - 225
-4. 4th	20. - 50.	20/ 400-1000	10- 4. /200	40/ 800-2000	14/280. - 700
-5. 5th	65. -200.	20/1250-4000	3- 1. /200	40/2500-8000	14/900. -2800

--6. 6th Finger counting only

--7. 7th Ability only to perceive and localize (project) light in one or more of the four quadrants

--8. 8th Inability to localize light perceived

--9. 9th No light perception

IMPAIRMENT OF VISUAL FIELD (360-371)

(See Appendix pages 61 and 62
for testing instructions.)

360	Right eye impairment	1st range	1-149 degrees
361		2nd range	150-299 degrees
362		3rd range	300-399 degrees
363		4th range	400-500 degrees
364	Left eye impairment	1st range	1-149 degrees
365		2nd range	150-299 degrees
366		3rd range	300-399 degrees
367		4th range	400-500 degrees
368	Binocular impairment	1st range	1-149 degrees
369		2nd range	150-299 degrees
370		3rd range	300-399 degrees
371		4th range	400-500 degrees

IMPAIRMENT OF OCULAR MOTILITY (372-379)

(See Appendix pages 62 and 63
for testing instructions.)

Impairment of Monocular Excursion in the Four Meridians (372-375)

372	Right or left eye	sursumduction (up) less than 20 degrees
373		abduction (nasal) less than 25 degrees
374		adduction (temporal) less than 25 degrees
375		deorsumduction (down) less than 30 degrees

Impairment of Haploopia (376-377)

- 376 1st range of diplopia 20-40 degrees
377 2nd range of diplopia less than 20 degrees
378
379

IMPAIRMENT OF BINOCULAR VISION (380-389)

Definition of normal function: the ability to see the same object with both eyes at the same time, so-called third-grade binocular vision, i.e., binocular vision with fusion and stereopsis, and phorias as listed in Appendix pages 64 and 65.

- 380 Absence or total loss of binocular vision
See Appendix for definitions (pages 63 through 65).
- 381 1st grade binocular vision, distance
- 382 1st grade binocular vision, near
- 383 2nd grade binocular vision, distance
- 384 2nd grade binocular vision, near
- 385 Lateral phoria, distance, not exceeding 6Δ *eso* or 8Δ *exo* unless compensated by the applicable vergence measurement equal to twice the phoria value
- 386 Lateral phoria, near, not exceeding 7Δ *eso* or 14Δ *exo* unless

compensated by the
applicable vergence
measurement equal to
twice the phoria value

- 387 Vertical phoria, distance, not exceeding 3 Δ .
- 388 Vertical phoria, near, not exceeding 3 Δ .
- 389 Combinations of 385, 386, 387, and 388.

Δ = prism diopter = deviation of 1 cm at 1 m

IMPAIRMENT OF COLOR VISION (390-399)

(all mutually exclusive, i.e., non-grouping) See Appendix pages 65 and 66 for testing instructions.

Anomalous Monochromacy (390-391)

(impairment of monochromatic color vision)

- 390 typical total color blindness (so-called) with low visual acuity, nystagmus, photophobia, inability for daylight adaptation, also called *rod-monochromacy*
- 391 atypical total color blindness (so-called) with otherwise normal acuity and adaptation, also called *conemonochromacy* (rare)

Anomalous Dichromacy (392-395)

(impairment of dichromatic color vision)

- 392 deuteranopia "green-blind"

- | | | |
|---|---|--|
| 393 | protanopia | "red-blind" |
| 394 | tritanopia | "blue-blind" |
| 395 | tetartanopia | yellow-blue disturbance - hypothetical |
| Anomalous Trichromacy (396-398) | | |
| (impairment of trichromatic color vision) | | |
| 396 | deuteranomaly | relatively poor vision in the green |
| 397 | protanomaly | relatively poor vision in the red |
| 398 | tritanomaly | relatively poor vision in the blue |
| 399 | Deficiencies of color vision
NEC/NOS | |

APPENDIX

IMPAIRMENT OF VISUAL FUNCTION

Instructions for Use of Code

IMPAIRMENT OF CENTRAL VISUAL ACUITY

Definition: Distance Vision

Measurement of visual acuity (or retinal resolving power) with the eye's accommodation adjusted for infinity fixation (for practical purpose this is 20 feet). When the measured level of acuity is so low as to make 20 feet impractical, shorter test distances may be utilized: under these circumstances of low visual acuity it may be presumed that no accommodation is stimulated even though such shorter testing distances are used. Furthermore, the use of distance vision test charts at shorter test distances must not be confused with tests for *near vision* performance.

Definition: Near Vision

Measurement of near vision performance (involving visual acuity plus other contributing factors) with the eye's accommodation adjusted for near fixation.

INSTRUMENTATION

- | | |
|----------------------|--|
| 1. acuity projectors | Near vision charts containing |
| 2. acuity charts | 1. conventional reading matter with letters grouped into words and sentences |
| | 2. isolated characters |

TEST CHARACTERS

- | | |
|----------------------------------|--|
| 1. Snellen letters or equivalent | 1. letters: lower case in standard print |
|----------------------------------|--|

APPENDIX (continued)

2. Landolt rings
3. tumbling E's

2. Landolt rings
3. numbers

ILLUMINATION

1. Illumination of the chart shall be 15-25 foot-candles.
2. Black/white contrast shall be 85 percent.
3. Room illumination shall average 10-12 foot-candles.

1. Illumination of the reading material shall be 20-25 foot-candles.
2. Black/white contrast shall be 85 percent.
3. Room illumination shall average 10-12 foot-candles.

Definition: Distance Vision

Definition: Near Vision

NOTATION AND METHOD OF RECORDING

Conventional Snellen notation in which the first number shall represent the test distance (in the USA this is expressed in feet) placed *over* the second number, the value of the letter read. Example: 20/1000.

Place the distance - either 40 (cm) or 14 (inches) - over the equivalent Snellen value of the line or character read: record the actual value of line or character read and type of near vision test chart used.

TESTING PROCEDURE

Acuity measurements shall be made for both *distance* and *near* vision with the

1. naked eye
2. existing ophthalmic lens correction in use, if any: *record* the prescription
3. best ophthalmic lens correction for refractive and accommodative deficiencies: *specify* the prescription

APPENDIX (continued)

TESTING PROCEDURE
(continued)

4. best magnification or vision aid: *record* the linear field of view and working distance with recommended optical and vision aid; *specify* the prescription and type of aid.
- | | |
|--|---|
| <ol style="list-style-type: none">1. Visual acuity measurements shall be made with chart at standard fixed distance - usually 20 feet.2. Lower visual acuities (e.g. 20/200 or less) may require varying the fixed testing distance.3. For visual acuity lower than 20/1000 the procedure shall be as follows:<ul style="list-style-type: none">-the chart may be placed at any fixed distance between 5 feet and 1 foot (or)-a single 20/200 letter (Sloan's optotype or equivalent) may be used: the letter is brought forward toward the patient and stopped at the point of recognition. <i>Record</i> the distance of recognition as the first number of the Snellen notation over 200. Example: 3/200.4. Visual acuity measurements lower than 20/4000 (1/200) will be graded as follows:<ul style="list-style-type: none">-finger counting (<i>state</i> distance)-light perception with accurate monocular projection only in stated quadrants (<i>state</i> light source and distance) | <ol style="list-style-type: none">1. Two tests shall be made:<ul style="list-style-type: none">-visual acuity (using isolated characters)-reading vision (using standard reading matter).2. For near visual acuity of 40/40 down to and including 40/400 the test chart shall preferably be held at 16 inches (40 cm).3. For near visual acuity lower than 40/400 down to 40/8000 tests shall preferably be made at 16 inches (40 cm) if possible. At times it will be necessary to bring the chart closer: if so, <i>state</i> the distance used.4. For near visual acuity lower than 40/400 down to and including 40/8000, tests may be made at closer distances than 16 inches if necessary. (If so, <i>state</i> distance.) |
|--|---|

APPENDIX (continued)

- light perception without accurate projection

- no light perception

Best magnification for vision aid (when used); in this case *record* also:

- observation (or testing) distance of chart from aid

- diameter of area seen (linear field of view) through aid

- type and magnification of aid.

DECIMAL CODE FOR 9 RANGES
EQUIVALENT MEASUREMENTS OF CENTRAL VISUAL ACUITY (300.-359.)

DISTANCE VISION			NEAR VISION			
		(1)	(2)	(3)	(4)	(5)
Range		arc/min.	20 ft./6 m.	variable distances	16 in./40 cm.	14 in./33 cm.
--1.	1st	0.65-3.	20/13-60		40/26-120	
	.1	0.65	20/13		40/26	14/9.1
	.2	0.8	20/16		40/32	14/12
	.3	1.0	20/20		40/40	14/14
	.4	1.25	20/25		40/50	14/17.5
	.5	1.5	20/30		40/60	14/21
	.6	2.0	20/40		40/80	14/28
	.7	2.5	20/50		40/100	14/35
	.8	3.0	20/60		40/120	14/42
--2.	2nd	4.-8.	20/80-160		40/160-320	
	.1	4.0	20/80		40/160	14/56
	.2	5.0	20/100		40/200	14/70
	.3	6.25	20/125		40/250	14/87.5
	.4	8.0	20/160		40/320	14/122
--3.	3rd	10.-16.	20/200-320		40/400-640	
	.1	10.0	20/200	20/200	40/400	14/140
	.2	12.5	20/250	16/200	40/500	14/175
	.3	16.0	20/320	12.5/200	40/640	14/225
--4.	4th	20.-50.	20/400-1000		40/800-2000	
	.1	20.	20/400	10/200	40/800	14/280
	.2	25.	20/500	8/200	40/1000	14/350
	.3	32.	20/650	6/200	40/1300	14/450
	.4	40.	20/800	5/200	40/1600	14/560
	.5	50.	20/1000	4/200	40/2000	14/700
--5.	5th	65.-200.	20/1250-4000		40/2500-8000	
	.1	65.	20/1250	3/200	40/2500	14/900
	.2	80.	20/1600	2.5/200	40/3200	14/1120
	.3	100.	20/2000	2/200	40/4000	14/1400
	.4	125.	20/2500	1.5/200	40/5000	14/1800
	.5	160.	20/3200	1.25/200	40/6400	14/2440
	.6	200.	20/4000	1/200	40/8000	14/2800

--6. 6th Finger counting only.

--7. 7th Ability only to perceive and localize (project) light in one or more of the four quadrants

- .01 in upper temporal quadrant
- .02 lower temporal quadrant
- .03 upper nasal quadrant
- .04 lower nasal quadrant
- .05 upper and lower temporal quadrants
- .06 upper temporal and upper nasal quadrants
- .07 lower temporal and lower nasal quadrants
- .08 upper temporal and lower nasal quadrants
- .09 lower temporal and upper nasal quadrants
- .10 upper and lower nasal quadrants
- .11 upper temporal and upper/lower nasal quadrants
- .12 lower temporal and upper/lower nasal quadrants
- .13 upper/lower temporal and upper nasal quadrants
- .14 upper/lower temporal and lower nasal quadrants
- .15 all four quadrants

--8. 8th Inability to localize light perceived

- .1 two-light discrimination only
- .2 light perception without any projection

--9. 9th No light perception

APPENDIX (continued)

IMPAIRMENT OF VISUAL FIELD (360-371)

Definition of Normal Function (AMA-9.27.58)

Minimum Normal Extent of Visual Field from Point of Fixation, for Each of the Eight 45-degree Meridians

temporally	85
down temporally	85
down	65
down nasally	50
nasally	60
up nasally	55
up	45
up temporally	55
total	<hr/> 500 degrees

Test Conditions

1. The extent of the peripheral field should be taken on a standard clinical perimeter with standard seven foot-candle (7 ft-c) illumination at 330 mm or 1/3 m. The test object should be a standard 3 mm white disk.
2. If the 3 mm field is not full peripherally, test objects should be increased in order of size to 6 mm, 9 mm, 18 mm, etc., and finally a 4 in. by 4 in. white gauze square. If the last is not visible, a diffuse light source such as a bare ophthalmoscope bulb should be used.
3. Central fields should be taken at 1 m on a standard clinical tangent screen, using, 1, 2, 5, and 10 mm size test objects, with illumination as indicated above.

Recording the Measured Loss

1. If the 3 mm field is limited, then 3 fields (isopters) with successively sized test objects should be recorded until the

APPENDIX (continued)

maximum field (isopter) is reached.

2. The minimum and maximum field should be recorded as seen by the patient.
3. A record of the degrees lost in each of the eight 45-degree meridians should be recorded; the total of all lost constitutes the total loss of visual field.

Coding the Measured Loss

1. The section number for Impairment of Visual Field is 360-371.
2. Right eye, left eye, and binocular are coded following the procedures for Impairment of Visual Acuity.
3. The total number of degrees which may be lost is 500. Losses from 1 degree to 500 degrees can be coded in two ways, either by *range* of loss (1st through 4th) or by using the exact number of total degrees lost as the code number *after* the decimal point, i.e., a loss in the 2nd range of 272 degrees = .272: for right eye, code:

Example: Section code 361.

range loss	.2	code: 361.2 (or)
exact loss	.272	code: 361.272

(or) a loss in the 4th range of 420 degrees = .420: for left eye code:

Section code 368.

exact loss	.420	code: 268.420
------------	------	---------------

IMPAIRMENT OF OCULAR MOTILITY (372-379)

Normal Ocular Motility in the Four Meridians (Cogan)

temporally	45 degrees
nasally	45 degrees
up	40 degrees
down	60 degrees

APPENDIX (continued)

Test Conditions

1. Standard test conditions as for acuity, without the addition of colored lenses or correcting prisms.
2. Each eye tested separately for monocular ductions in the four meridians and the degree of loss in each recorded.
3. Both eyes tested for diplopia: the extent of the separation of the two images determined on the perimeter at 330 mm or on any tangent screen at a distance of 1 m from the person, and plotted on a visual field chart for each of the four meridians.

American Medical Association
Committee on Medical Rating
of Physical Impairment

(Visual System). Section on Ocular Motility: 9.27.58:

"Unless diplopia is present within 30 degrees of the center of fixation, it rarely causes significant visual loss except on looking downward. The extent of the diplopia in the various directions of gaze is determined on the perimeter at 330 mm or on any tangent screen at a distance of 1 m from the patient in each of the 45-degree meridians, with use of a small test light and without the addition of colored lenses or correcting prisms."

IMPAIRMENT OF BINOCULAR VISION (380-389)

This section is concerned with the classification of impairments of binocular vision in which there is no paresis of the extra-ocular muscles. These impairments may be motor, sensory, or perceptual in origin but in any event the impairment shall be consistent for any position of gaze for a given distance of fixation. (Where impairment varies for different positions of gaze, they should be classified under Code Section dealing with Ocular Motility.)

APPENDIX (continued)

Classification of Binocular Vision

First grade binocular vision: (impaired function) binocular vision with simultaneous perception only.

Second grade binocular vision: (impaired function) binocular vision with fusion.

Third grade binocular vision: (normal function) binocular vision with fusion and stereopsis.

Normal binocular vision classifications are based on demonstration of the following performance qualities:

Third grade binocular vision at distance or near.

Lateral phoria, distance, not exceeding 6 Δ *eso* or 8 Δ *exo* unless compensated by vergence measurement equal to twice the phoria value.*

Lateral phoria, near, not exceeding 7 Δ *eso* or 14 Δ *exo* unless compensated by vergence measurement equal to twice the phoria value.

Vertical phoria (distance and near) not exceeding 3 Δ unless compensated by vergence measurement equal to twice the phoria value.

Wearpoint of convergence (NPC) must not exceed 200 mm at any age.
Give Code Number.

Definitions

Phoria

The condition in which the primary visual axis of one eye fails to intersect the object of fixation when fusion is broken.

Fusion

The process by which similar stimuli seen separately by the two eyes are combined into a unitary percept.

Simultaneous Perception

The perception of normally visible objects in all parts of the field of vision of each eye upon simultaneous stimulation of both eyes.

* Δ = prism diopter = deviation of 1 cm at 1 m.

APPENDIX (continued)

Stereopsis

Visual perception of three dimensional space.

Vergence

The movement of the two eyes in opposite directions to maintain fusion through prisms at a fixed testing distance.

Test Conditions

Tests should be made at distance and near, using standard test conditions, and any of the following:

1. major amblyoscope
2. clinical stereoscope
3. the Wirt stereo test
4. the modified Verhoeff Depth Perception Test
5. loose or rotary prisms
6. bar test

Vertical phoria for near should be tested not only at *horizontal* but also at 20 degrees *below the line*. Code these.

IMPAIRMENT OF COLOR VISION (390-399)

Definitions

Trichromate Color Vision (Normal Color Vision)

Need for no less than three suitably chosen spectrum samples (so-called "primaries") to match the hue of any given spectrum wavelength (sex-linked).

Dichromatic Color Vision (Impaired Function)

Need for only two suitably chosen spectrum samples to match the hue of any given spectrum wavelength (sex-linked).

APPENDIX (continued)

Monochromatic Color Vision (Impaired Function)

Ability to match the hue of any given spectrum wavelength with any other spectrum sample (not sex-linked).

Test Conditions

1. Farnsworth 16-hue test with MacBeth easel lamps
2. Farnsworth color lantern test (4 lights)

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